The Journal of the American Medical Association

Published Under the Auspices of the Board of Trustees

VOL. 127, No. 17 — CHICAGO, ILLINOIS — APRIL 28, 1945

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MYASTHENIA GRAVIS

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In the last eight years there has been considerable advance in our knowledge of myasthenia gravis. This somewhat rare disease is characterized by easy fatigability of the voluntary muscles. A growing interest in the disease is based on a number of recent developments: the formulation of the chemical mediation theory of the transmission of nerve impulses across a synapse by the peripheral release of a specific agent, first suggested by Otto Loewi [1] in 1921 to explain the actions of the autonomic nerves on their effector organs and later expanded by Dale, Feldberg and Vogt [2] to account for a similar reaction at the end plates of motor nerves to voluntary muscles; the discovery in 1934-1935 by Walker [3] of the therapeutic effects of physostigmine and prostigmine (neostigmine) in alleviating the symptoms of myasthenia gravis, and the stimulation given by Blalock,[4] whose removal of the thymus in 1941 in cases of myasthenia gravis reopened the whole controversial subject of the relation of the thymus to this disease. In spite of these three important contributions, a complete conception of the cause of myasthenia gravis still eludes us and many clinical features are not understandable. The present paper attempts to evaluate our knowledge based on nine years of experience in seeing 125 cases at the Massachusetts General Hospital, plus a summary of our investigations undertaken, the results found and a review of the most important literature.

Although the syndrome of muscular fatigability now known as myasthenia gravis was first described by Willis [5] in the seventeenth century, it was not until the close of the nineteenth century that the disease was fully recognized by Erb [6] in 1878 and five years later by Goldflam [7] in 1893. Jolly [8] gave the name to the disease in 1895. By 1900 the disease was fully recognized and reports of cases were issued from many centers, both in Europe and in America. The first cases in the records of the Massachusetts General Hospital occurred in 1905, and 31 patients received this diagnosis between then and 1934 after investigations in the wards.[9] This figure covering a period of thirty years may be contrasted with over 100 cases seen at the same hospital in the last nine years, illustrating the growing interest in the disease now that a more exact and early diagnosis is possible and neostigmine therapy is available.

To study the clinical aspects of the disease, an outpatient clinic was established in 1935. Since that date patients have been seen at intervals of two weeks to six months, depending on the severity and stage of the disease. About 60 cases are constantly followed in the clinic, thus giving an important source for study of such problems as the age of onset, the first symptoms, remissions and relapses, deaths, the effects of various forms of treatment and the symptoms as shown in special organs of the body. Constant watchfulness over patients, moreover, insures a prompt change in treatment schedule, a not unimportant matter in a disease with rapid and often unexpected variations in symptomatology. Not infrequently, quick action in increasing the neostigmine intake means the saving of a life.

DIAGNOSIS

The diagnosis of myasthenia gravis is often not difficult. Even prior to the recent tests made available for this purpose, the older neurologist had no difficulty describing the disease and making an unmistakable diagnosis in well defined cases. In reading the case records written before 1935, most give a clear and certain history. Some records may be used to contrast with the material collected since 1935.

The year 1935 is a turning point in the historical development of our knowledge of the disease, for in that year Mary Walker showed the dramatic effects of neostigmine, when given by injection, on the muscular weakness of patients with myasthenia gravis. Neostigmine was first used by us in March 1935, and before the end of that year Viets and Schwab [10] had described a diagnostic test using neostigmine as the basis for the improvement in symptoms. This test was later modified from its original form in 1936 [11] and made more definitive in a report in 1938.[12] The test has been used extensively in our clinic and elsewhere since that date

From the Myasthenia Gravis Clinic, Massachusetts General Hospital.
Owing to lack of space, this article is abbreviated here. The complete article will appear in the author's reprints.
Read before the Section on Nervous and Mental Diseases at the Ninety Fourth Annual Session of the American Medical Association, Chicago, June 14, 1944.

1. Loewi, O.: Ueber humorale Uebertragbarkeit der Herznervenwirkung, Arch. f. d. ges. Physiol. **189**: 239, 1921.
2. Dale, H. H.; Feldberg, W., and Vogt, M.: Release of Acetylcholine at Voluntary Motor Nerve Endings, J. Physiol. **86**: 353, 1936.
3. Walker, M. B.: Treatment of Myasthenia Gravis with Physostigmine, Lancet **1**: 1200 (June 2) 1934; Case Showing Effect of Prostigmine on Myasthenia Gravis, Proc. Roy. Soc. Med. **28**: 759 (April) 1935.
4. Blalock, A.; Harvey, A. M.; Ford, F. R., and Lilienthal, J. L., Jr.: The Treatment of Myasthenia Gravis by Removal of the Thymus Gland, J. A. M. A. **117**: 1529 (Nov. 1) 1941.
5. Willis, Thomas: De anima brutorum, London, R. Davis, 1672, p. 288.
6. Erb, Wilhelm: Zur Casuistik der bulbären Lähmungen: III. Ueber einem neuen, wahrscheinlich bulbären Symptomencomplex, Arch. f. Psychiat. **9**: 336, 1878.
7. Goldflam, S.: Ueber einen scheinbar heilbaren bulbärparalytischen Symptomencomplex mit Betheiligung der Extremitäten, Deutsche Ztschr. f. Nervenh. **4**: 312, 1893.
8. Jolly, F.: Pseudoparalysis myasthenica, Neurol. Centralbl. **14**: 34, 1895; Myasthenia gravis pseudoparalytica, Verhandl. d. Berl. med. Gesellsch. (pt. 2) **25**: 249, 1895.
9. Viets, H. R., and Schwab, R. S.: Myasthenia Gravis: Clinical Observations of Fifty Cases, Cong. neurol. internat., Compt. rend., 1939, pp. 576-590.
10. Viets, H. R., and Schwab, R. S.: Prostigmine in the Diagnosis of Myasthenia Gravis, New England J. Med. **213**: 1280 (Dec. 26) 1935.
11. Viets, H. R., and Schwab, R. S.: The Prostigmine Test in Myasthenia Gravis: Second Report, New England J. Med. **215**: 1064 (Dec. 3) 1936.
12. Schwab, R. S., and Viets, H. R.: The Prostigmine Test in Myasthenia Gravis: Third Report, New England J. Med. **219**: 226 (Aug. 18) 1938.

and has proved to be of value in confirming the usual diagnostic impression made from the clinical history. The correct amount of the drug, namely, 1.5 mg. of neostigmine methylsulfate with 0.6 mg. of atropine sulfate, is now supplied in a single diagnostic ampule. This is the dose for an ordinary adult and it is important to use as much neostigmine methylsulfate as this ampule contains, for a false report of "no improvement" may occur in some patients with a smaller amount. There is no definite rule in regard to this, but the dosage provided by the diagnostic ampule has been found to be satisfactory. Occasionally even more neostigmine is needed to make the diagnosis certain. Atropine is useful to prevent the muscarine-like effect on the smooth muscles and ordinarily 0.6 mg. is sufficient for this purpose. Sometimes a further injection of an equal amount of atropine sulfate is useful if the patient has many disagreeable symptoms, such as pallor, sweating, a feeling of constriction of the chest, gaseous eructations, rumbling, diarrhea or even general collapse.[13] Fortunately, such a response rarely occurs and seldom takes place in a patient with myasthenia gravis. The very fact that a patient can take this amount of drug without smooth muscle stimulation is suggestive of the diagnosis of myasthenia. The principal results, however, are the rapid removal of the weakness of the voluntary muscles, with a return of the ability to move the eyes and the facial muscles and normal resumption of the functions of chewing, talking and swallowing. In addition, the musculature of the neck, back and extremities may improve, if they are involved, the patient being able to hold the head up without difficulty and lift the arms above the shoulders, with the arms and fingers fully outstretched, and cross the legs, three functions due to specific involvement of muscle groups commonly affected in myasthenia gravis.

Many hundred tests with the diagnostic ampule have only confirmed the original observations that neostigmine is a specific antidote for the curare-like symptomatology of myasthenia gravis. A few other diseases respond slightly to parenteral neostigmine, such as amyotrophic lateral sclerosis, bulbar palsy, some of the muscle dystrophies and syndromes of a similar nature. The response, however, is minimal, ordinarily less than 5 per cent and never over 10 per cent of the effect seen in myasthenia gravis patients.

It is possible to make patients with myasthenia gravis worse by the use of curare or quinine. Rarely in my opinion is this necessary, as the disease is usually distinctive enough by history to make the diagnosis certain before injection of neostigmine is used. In none of the series have I felt justified in using either quinine or curare, but I have no objection to using curare under due precautions as outlined by Bennett and Cash [14] or quinine as advocated by Harvey and Whitehill [15] and by Eaton [16] if I felt that they were needed in order to make the diagnosis certain. The response to neostigmine injection, however, is usually so free from disagreeable symptoms and the results are so striking that preliminary medication with curare or quinine does not seem to be justified except in a most unusual case.

13. Goodman, L. S., and Bruckner, W. J.: The Therapeutics of Prostigmine, J. A. M. A. **108**: 965 (March 20) 1937.
14. Bennett, A. E., and Cash, P. T.: Myasthenia Gravis: Curare Sensitivity; a New Diagnostic Test and Approach to Causation, Arch. Neurol. & Psychiat. **49**: 337 (April) 1943.
15. Harvey, A. M., and Whitehill, M. R.: Quinine as an Adjuvant to Prostigmine in the Diagnosis of Myasthenia Gravis: A Preliminary Report, Bull. Johns Hopkins Hosp. **61**: 216 (Sept.) 1937.
16. Eaton, L. M.: Diagnostic Tests for Myasthenia Gravis with Prostigmine and Quinine, Proc. Staff Meet., Mayo Clin. **18**: 230 (July 14) 1943.

The use of the fluoroscope to study the swallowing reflex before and after neostigmine injection, as described by Schwab and Viets,[17] is one of the most important of the various maneuvers used in diagnosis. Under these circumstances all question of voluntary control is eliminated and the actual retention of barium in the pharynx and pyriform sinuses is unmistakable evidence of a structural disease affecting the swallowing mechanism. If, after the neostigmine methylsulfate is given, the patient is able to swallow normally, without retention of barium in the throat, the diagnosis of myasthenia gravis cannot be questioned. Such a result does not occur in bulbar palsy. A small amount of a thin mixture of barium should be used in a suspected case of bulbar palsy. No increase in the release of the barium on the sides of the pharynx is observed when neostigmine is injected, but the retention of it may cause considerable difficulty and patients have been known to choke and even have stopped breathing under these conditions. A careful examination of the posterior pharynx usually reveals widespread weakness and atrophy of the muscles, with fibrillations in patients suffering from bulbar palsy. These aspects, however, are not present in cases of pseudo-bulbar palsy and here the diagnosis is greatly facilitated if the patient does not respond to the neostigmine test.

THEORIES OF CHEMICAL MEDIATION AS APPLIED TO MYASTHENIA GRAVIS

That there might be a chemical mediation in the transmission of a nerve impulse across a synapse was first suggested by the work of Otto Loewi in 1921. The fundamental facts established by him in his report are now an integral part of physiology and they have led to great progress in this and other fields of investigation. His work dealt with the autonomic system, but it was not long before Dale, Feldberg and Vogt and others applied the same findings to the neuromuscular junction of the striated muscle system. The "vagus stuff" first suggested by Loewi was thought to be acetylcholine by Feldberg and Krayer.[18] This was indeed proved to be the case by Dale,[19] and we know that acetylcholine is a necessary constituent at the synapse for the passage of the nervous impulse.[20] Continued development showed that an enzyme also was present, cholinesterase, whose specific function it was to split acetylcholine by hydrolysis and thus prevent the continued transmission of a nerve impulse to an individual muscle. Cholinesterase, moreover, was found widely disseminated in the blood and body tissue. It is this enzyme that is temporarily inactivated by physostigmine and its closely related drug, neostigmine. So widespread is the release of acetylcholine at the end plates of nerves that this whole system of nerves which release this substance at their end-plates are now referred to as cholinergic nerves. It has been shown, moreover, that acetylcholine has a nicotinic-like effect on striated muscles and a muscarine-like effect on smooth muscles. The muscarine-like action may be overcome by the use of atropine sulfate, thus removing from the effect of the drug one of the symptoms that would be most undesirable in the treatment of myasthenia gravis. The subject of

17. Schwab, R. S., and Viets, H. R.: Roentgenoscopy of the Pharynx in Myasthenia Gravis Before and After Prostigmine Injection, Am. J. Roentgenol. **55**: 357 (March) 1941.
18. Feldberg, W., and Krayer, O.: Das Auftreten eines azetylcholinartigen Stoffes im Herzvenenblut von Warmblütern bei Reizung der Nervi vagi, Arch. f. exper. Path. u. Pharmakol. **172**: 170, 1933.
19. Dale, H. H.: Physiology of the Nervous System, Science **90**: 393 (Oct. 27) 1939.
20. Nachmansohn, D.: On the Physiological Significance of Choline Esterase, Yale J. Biol. & Med. **12**: 565 (May) 1940.

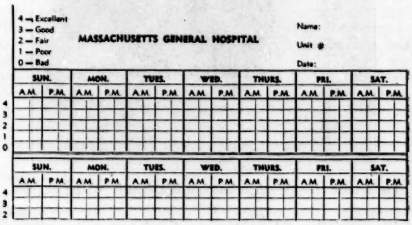
the chemical mediation is still a field of intensive investigation. Only recently Nachmansohn [21] has described another enzyme, choline-acetylase, which synthesizes acetylcholine, and gradually a whole chain of reactions is being established in which the release of acetylcholine is only one of the steps. Nachmansohn has referred to this as the "acetylcholine cycle." When the whole cycle is understood, it is quite possible that the explanation of myasthenia gravis may be revealed and that a more specific treatment aimed at elimination of the etiologic factor will be evolved.

TREATMENT

On the assumption that the health of the patient with myasthenia gravis depends on an adequate amount of neostigmine being maintained to inhibit the cholinesterase at all times, taken in consideration with the amount of muscle work of any kind that the patient is doing during the course of twenty-four hours, an attempt is made to give the drug so that a neostigmine level will be maintained during the entire period. The variations in the amount that are necessary to accomplish this purpose are considerable. Some patients are maintained on a minimal amount of neostigmine. In a few cases as little as 15 mg. divided in two doses taken by mouth are sufficient to relieve mild symptoms. General weakness or more specific symptoms, such as ptosis, diplopia, dysarthria or dysphagia, usually require larger amounts. The average intake of 45 ambulatory patients seen during 1943 and 1944 was 10.9 tablets of neostigmine bromide, 15 mg. each, spaced during the twenty-four hours, or a total of 163.5 mg. The highest dosage was 25 tablets a day for a patient who has been maintained on this intake for a number of years.

CASE 1.—J. B., a man aged 28, had experienced spells of generalized muscle weakness since the age of about 15 years. The chief symptom at the onset was weakness in his legs, with difficulty in running and climbing upstairs. He fell down frequently and could not compete in games with other boys. Subsequently he developed difficulty in chewing, ptosis and diplopia. At first the patient was aided by taking ephedrine sulfate. In November 1935 he was given neostigmine bromide by mouth. The diagnostic test was strongly positive, and it was soon discovered that he needed as many as 15 tablets of neostigmine bromide, 15 mg. each, in twenty-four hours. In addition he took potassium chloride and continued the ephedrine sulfate. The dosage established in 1937 has been continued, with slight variation, for the last seven years. During most of this period it was found that 15 tablets of neostigmine a day was not sufficient to maintain him, and the dose was increased to between 20 and 25 in about 1939. There it has remained for five years, the patient showing no tendency toward remissions or relapses. During this period he has been able to work intermittently in a garage and as a foreman in a defense plant, and he appears to be well adjusted on his present intake. Any variation from it, however, causes pronounced muscle weakness and disability. On numerous occasions he has been taken off this large dosage only to reveal excessive weakness with inability to turn over in bed, talk or swallow. At the present time, in 1944, he is taking the following drugs at spaced intervals during the day and night: neostigmine bromide 20 tablets, 15 mg. each; ephedrine sulfate, 5 capsules, 24 mg. each; potassium chloride, 25 per cent solution, 60 cc. a day.

In addition to the total amount given in twenty-four hours, the spacing of the drug during this period is of considerable importance. Information in regard to the hourly needs can be obtained from the patient by the use of a chart on which the patient records his state of health four times a day (fig. 1). This is based on a simple score used by Schwab and Skogland [22] and has proved efficient for the purpose outlined here. The patient estimates his condition at four periods during the day, usually at 8 a. m., 12 noon, 4 p. m. and 8 p. m. After two or three weeks of observation the physician is able to space the drugs to suit the patient's needs. If his worst periods, for instance, occur consistently early in the morning, neostigmine is added during the night. A number of patients wake themselves up at 2 a. m. and take 1 or 2 tablets under these circumstances. Attempts should not be made to change the schedule in the average case without an observation period of at least two weeks. A trial daily schedule is followed for the first fortnight, adjusted at the end of that period, the average patient being seen again in two weeks and then at varying times thereafter, depending on the patient's adjustment to the drugs taken. A copy of the daily dosage is given to the patient at each interview with a carbon copy retained by the physician. It is useful to have an hourly schedule for this purpose such as the one used at the Massachusetts General Hospital. Various dosage schedules under this system have been reported by Viets and Schwab.[23]


4 = Excellent
3 = Good
2 = Fair
1 = Poor
0 = Bad

MASSACHUSETTS GENERAL HOSPITAL

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Fig. 1.—Top, slightly reduced, of patient's daily report of symptomatic improvement under treatment for myasthenia gravis. There are six rows of these daily reports on each side of the blank, the actual size of which measures 7⅞ by 11¼ inches. The patient records the state of his health four times a day, usually at 8 a. m., 12 noon, 4 p. m. and 8 p. m. in the appropriate squares. A study of the chart at intervals of two weeks often enables the physician to rearrange the hourly intake schedule so that the patient is more effectively maintained.

When the patient is more seriously ill than the average occurring in an ambulatory clinic, neostigmine is of necessity given in the form of neostigmine methylsulfate by subcutaneous or intramuscular injection. The subcutaneous dosage is satisfactory with a hypodermic syringe, and because of this patients may be trained to give the injections themselves, similar to the procedure adopted in the treatment of diabetes. Now all patients, no matter how mild their disease, are given ampules of neostigmine methylsulfate, with instructions for injections in case an emergency arises in the course of their disease. As respiratory embarrassment due to weakness of the diaphragm and chest muscles may be of rapid onset, it is well to have all patients prepared for this possibility. The patients keep a small supply of the drug in this form at home, with a letter of instruction as outlined by Viets,[24] so that any physician or nurse called in the emergency, even if unfamiliar

21. Nachmansohn, D.: Acetylcholine and the Mechanism of Nerve Activity, Exper. Med. & Surg. **1**: 273 (Aug.) 1943.

22. Schwab, R. S., and Skogland, J. E.: A Method of Evaluating the Effect of Treatment in Neuromuscular Disorders, Journal Lancet **61**: 401 (Oct.) 1941.

23. Viets, H. R., and Schwab, R. S.: The Diagnosis and Treatment of Myasthenia Gravis, with Special Reference to the Use of Prostigmine, J. A. M. A. **113**: 559 (Aug. 12) 1939.

24. Viets, H. R., in Blumer, G.: The Practitioners Library of Medicine and Surgery: 1940 Supplement, New York, D. Appleton-Century Company, Inc., 1941, pp. 592-601.

with the disease and its treatment, will be able to follow the specific instructions. A patient, moreover, who is fairly well maintained on neostigmine bromide by mouth may need the rapid and complete effect of an injection in order to swallow an adequate meal. Patients with dysphagia tend to eat less and less, lose weight and sometimes develop intestinal disturbances. If they can

Fig. 2 (case 2).—Thymus as removed at operation. Weight 11.5 Gm.

take one full meal in the course of twenty-four hours, enough calories and vitamins can be taken to prevent nutritional disability. An injection, therefore, half an hour before this meal often enables the patient to take the meal without difficulty and therefore maintain his weight.

For some patients seriously ill it is necessary to give neostigmine entirely by parenteral methods. The drug under these circumstances may be increased to a dosage as high as 31 mg. in the course of twenty-four hours, given in hourly doses. Such a patient under a large dosage was recently the subject of a report by Viets.[25] This patient showed serious symptoms of respiratory difficulty on smaller doses, and it was not until 1 or 1.5 mg. of neostigmine methylsulfate was given every hour through the night and day that the patient responded and became well adjusted. It is now known that, to inhibit cholinesterase, large doses of neostigmine are needed. Krayer, Ellis and Root[26] have indicated this in their experiments on dogs, using a continuous intravenous infusion of neostigmine methylsulfate to inhibit the normal cholinesterase activity. More neostigmine methylsulfate is needed in proportion to the amount of cholinesterase activity inhibited in a patient who is very sick compared with one who has few symptoms. At least in 1 patient, it was not until the dosage was raised to a large amount that the patient became well adjusted and was able at a future date to reduce the total intake without having more severe symptoms.

A principle of treatment, therefore, seems to be that adequate amounts of neostigmine bromide must be given by mouth to ambulatory patients, properly spaced through the day and night. When this is not sufficient because of excessive need or because the patient has difficulty in swallowing, neostigmine methylsulfate may be used by injection to replace the oral medication. Under ordinary circumstances 0.5 mg. of neostigmine methylsulfate equals 15 mg. of neostigmine bromide taken by mouth.

THE USE OF OTHER DRUGS

Three other drugs are commonly used in the treatment of myasthenia gravis: ephedrine sulfate, potassium chloride and guanidine hydrochloride. Ephedrine sulfate, known for many years as a valuable form of treatment, is a useful adjunct to neostigmine. Its effectiveness is about 10 or 15 per cent of that of neostigmine. It is possible to maintain a few patients entirely on this drug if their symptoms are not very severe or if they are in a prolonged partial remission. Ordinarily ephedrine sulfate is added in doses of 24 mg. two or three times a day to the regular neostigmine schedule. About half of the patients under observation have found the drug useful for this purpose and have continued to take it over long periods of time. As most patients with myasthenia gravis are sensitive to the changes in intake of their medication, we have come to depend on them to evaluate the various drugs taken in addition to neostigmine. The only caution ordinarily needed with regard to ephedrine sulfate is in relation to its possibility as a cause of insomnia. For this reason the drug is ordinarily not taken after 12 o'clock noon; with this spacing, sleeplessness in most cases does not occur. Rarely do patients take more than 3 to 5 tablets of ephedrine sulfate, and no patient at the present time (1944) is being maintained on this drug alone.

Potassium chloride has a mild effect on the symptoms of myasthenia gravis in a small percentage of the patients. The chief difficulties in using potassium are the disagreeable symptoms arising from its intake by

Fig. 3 (case 2).—Low power section, reduced, of thymus showing fatty infiltration about 50 per cent.

mouth. Most patients find it difficult to take the drug and gradually give it up over the course of months after thorough trial, partly because it is so disagreeable to take and partly because its effectiveness is so slight. A few patients, such as patient 1, continue to take it in a 25 per cent solution disguised in orange or tomato juice, without much difficulty. Less than 10 per cent of the patients, however, in the clinic use potassium chloride.

25. Viets, H. R.: Myasthenia Gravis Treated with Large Doses of neostigmine Methylsulfate Intramuscularly and Intravenously and with Neostigmine Bromide Orally, Am. J. M. Sc. **208**: 701 (Dec.) 1944.
26. Krayer, Ellis and Root: Personal communication to the author.

Guanidine hydrochloride has a considerable effect on the symptoms of myasthenia gravis.[27] One patient has taken 9 tablets of 125 mg. a day for many years with complete relief from her disability. She did so, however, only after a rather disagreeable year of paresthesia around the mouth and at the fingertips when the drug was first started. This has been the experience with

Fig. 4 (case 4).—Gross appearance of thymus as removed at operation. Weight 11.3 Gm.

nearly all of the other patients who have taken this guanidine, and because of this annoying symptom, except in a few instances, they have given it up. Although the drug is useful and over long periods the paresthesia may be overcome, this feature precludes its widespread use as far as our patients are concerned. The more effective drug neostigmine has a tendency, moreover, to overcome the less effective drugs in the mind of a patient and gradually most patients drop guanidine, feeling that the usefulness of the drug in improving their symptoms is not sufficient to justify the annoyance of the oral and digital paresthesia.

When neostigmine bromide is taken by mouth, part of the smooth muscle stimulation may be overcome by the taking of a small amount of food with each dosage. The rapid absorption of neostigmine when the stomach is empty seems to account for most of the disagreeable symptoms. Slight retardation of absorption by food in the stomach has proved to be especially useful and has now become a routine in the clinic for the first few months for all patients taking the drug.

THYMUS AND THYMECTOMY

Following the work of Blalock, 15 patients have been subjected to thymectomy from the clinic in the last four years. One was operated on at the Massachusetts Memorial Hospital in Boston and another at the Johns Hopkins Hospital, the other 13 all being operated on at the Massachusetts General Hospital by Edward G. Churchill and Oliver Cope. There have been four operative deaths, or 26.6 per cent. Thymomas have been found in 4 patients. Hyperplasia of the thymus was found in 3, and the thymus appeared normal, although persistent, in 8 other cases. Of the total group of 15 having thymectomy, some are now in their second and third year following operation. Two are considered at the present time (June 1944) as in complete remission, 2 more are distinctly improved, 3 are moderately improved, 1 slightly improved, and 3 have been operated on too recently to be evaluated. None of these patients have relapsed. The patient showing the best improvement gave the following history:

CASE 2.—Mrs. E. A. H., aged 35, was first seen in 1932, at the age of 22, with dysarthria, diplopia and dysphagia. Six months after leaving the hospital she had a complete remission beginning at about the third month of a pregnancy. The remission continued through the last six months of pregnancy and for three months after parturition, at which time a relapse occurred. Her early symptoms were moderately well controlled on ephedrine sulfate, but she was greatly improved after 1936 on neostigmine bromide 10 tablets a day. A neostigmine test was strongly positive. A second pregnancy occurred in 1940. For the first five and one-half months her symptoms were increased and she required 20 tablets of neostigmine a day. About the end of the sixth month of pregnancy she began to have a rapid remission, which went on to completeness and lasted for a number of months after delivery. During the remission she required only 1 neostigmine bromide tablet a day. Reverting to her regular intake of 10 to 12 tablets in 1941, she did not respond to irradiation of the thymus. Direct transfusion from a normal person four and one-half months pregnant made no change in her symptoms.

Thymectomy was done March 18, 1942 after a preoperative observation period of ten years, during which time, except for the intervals of pregnancy, she had been nearly entirely free from remissions or relapses. The thymus gland as removed at operation weighed 11.5 Gm. (fig. 2). On section the gland appeared normal, although there was 50 per cent fat infiltration (fig. 3).

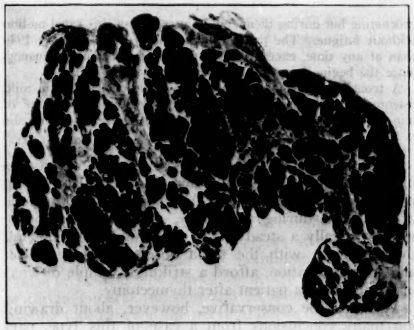

Fig. 5 (case 4).—Low power section, reduced, of tumor showing slight fat infiltration with hyperplastic thymus tissue.

The patient began to improve almost immediately after the operation, and by the time she left the hospital, a month later, she was not taking any neostigmine and had not done so for ten days. The remission therefore occurred about three weeks after the operation. During the entire period of over a year since operation the patient has continued to remain comparatively well without medication. She retains a partial ophthalmoplegia of one eye, not improved by neostigmine.

27. Dodd, Katharine; Riven, S. S., and Minot, A. S.: Further Experience with the Use of Guanidine Hydrochloride in the Treatment of Myasthenia Gravis, Am. J. M. Sc. **202**:702 (Nov.) 1941.

The remission since operation has not been quite complete. On at least two occasions there were attacks of generalized weakness lasting a week at a time, one in December 1942 and another in January 1943. During these periods there was no change in the condition of her eyes but there was weakness in the arms, legs and back, so that she could not do all her housework. Between periods of mild relapse she had no difficulty in

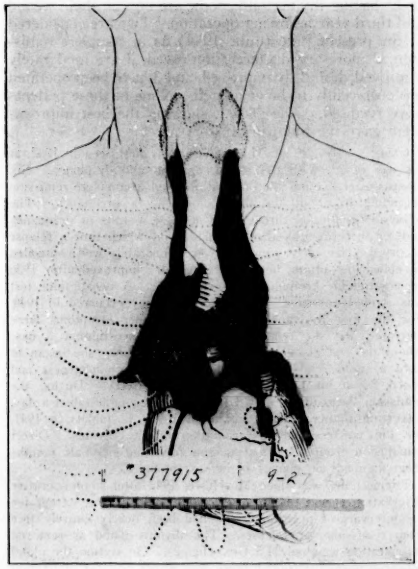

Fig. 6 (case 5).—Gross appearance of tumor as removed at operation. Weight 40 Gm. Thymoma at base of right half specimen.

crocheting but during them could not carry out this rapid motion without fatigue. The patient thinks she is better in May 1944 than at any time, except for the periods during her pregnancy, since the beginning of her symptoms in August 1931.

A troublesome complication of the operation has been a mild osteomyelitis of the sternum which has required a number of minor surgical operations. In May 1944 it is estimated that she is 90 per cent better than before operation.

There are a number of unusual features about this history. The patient was under observation for a long period prior to operation. Although she had periods of remission during pregnancy, otherwise her course was practically a steady one. Her condition following the operation, with the rapid onset of the remission and its continuation, afford a striking example of what may happen to a patient after thymectomy.

We must be conservative, however, about drawing too many conclusions from a case of this type, particularly in view of the fact that a normal thymus partly infiltrated with fat was found at operation. Her remission, moreover, might be spontaneous in character, such as not infrequently occurs, as is illustrated by the following case report:

Case 3.—B. C., a man aged 60, began to have symptoms of general fatigue about the middle of July 1943. Within a few weeks he developed dysphagia and dysarthria. He rapidly lost nearly 30 pounds (13.6 Kg.) in weight. On examination the patient showed bilateral ptosis, nasal voice, great difficulty in swallowing, weakness in holding up the jaw and some general weakness in his arms and legs, with a partial foot drop on the right. He responded rapidly on neostigmine by injection, and the swallowing reflex was almost normal after the test with a diagnostic ampule.

From October 1943 to January 1944 he was maintained on 12 to 14 tablets of neostigmine bromide a day, augmented with one or more injections of neostigmine methylsulfate taken prior to eating. He slowly gained back the weight that he had lost and developed a complete spontaneous remission about April 1, 1944. When last seen, May 23, 1944, the patient showed no signs of his disease and was not taking any medicine. He had put on 35 pounds (16 Kg.) and was doing full time work as a clerk in a store.

It is thus possible to have spontaneous remissions occur rapidly and completely. Many other examples could be cited from the experience in our clinic. These remissions may last a matter of months or even years. Some are known to have lasted twenty or more years. Many of them last four or five years. Their character is in no way different from the remission noted in case 2 following thymectomy. In cases that have been under observation, however, for many years, prior to thymectomy, as case 2, it would seem unlikely that a spontaneous remission would occur so promptly after operation.

Other patients, following operation, have not done so well. One, with a history similar to that of patient 2, who had been under observation for two and one-half years, had a normal thymus weighing 15.5 Gm. removed. About 30 per cent of the thymus was replaced with fat. This patient remains practically unchanged three years and five months after the operation. So far as we can

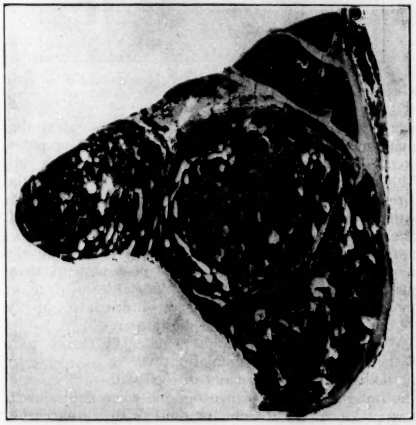

Fig. 7 (case 5).—Low power section, reduced, of tumor, showing compact character.

see there is no reason why he should not have done as well as patient 2.

The fact that the thymus shows hyperplasia when removed does not necessarily mean that the patient will show improvement as a result of the operation. The following case may be cited as an example:

Case 4.—E. T., a woman aged 24, first seen in 1933 at the age of 13 with ptosis and fatigue, could walk and run but tired quickly, more so than other children of her age. There was some weakness in chewing, and examination showed a

complete bilateral ophthalmoplegia, with the pupils reacting normally to light and in accommodation. The facial muscles also were involved. She did not improve on ephedrine sulfate, but in 1935 a neostigmine test was strongly positive and subsequently she took 5 or 6 tablets of neostigmine bromide a day by mouth. She was considerably improved as far as her general symptoms were concerned, but her eyes were not much better. Between 1935 and 1942 she was tried on various schedules of neostigmine bromide, guanidine hydrochloride, ephedrine sulfate and potassium chloride. Neostigmine helped her more than any other drug and she finally reverted to this entirely, after long periods of experimentation with the other forms of medication. She was fairly well during this period and in 1939 was able to go by automobile to California from Boston and return.

Because her symptoms were relatively unchanged and she had been under observation a long time, she seemed to us a suitable case for thymectomy. This was done Jan. 14, 1942. The thymus weighed 11.3 Gm. (fig. 4). It showed very little fatty replacement but was hyperplastic (fig. 5). Two years and four months after the operation the patient shows slight general improvement and she is being maintained on about half the amount of neostigmine needed before the operation. The condition of her eyes is practically unchanged. After the operation the patient had a mild remission, which has continued, but she does not feel that the benefit quite justified going through the operative procedure. Her improvement cannot be scored as more than 20 to 25 per cent, but that some improvement is present is unmistakable.

Four of the patients in the series had thymomas, but it is not clear at the present time that they have done better than some of the patients with hyperplasia of the thymus or indeed those whose thymus was normal. An example of a patient with a thymoma is as follows:

CASE 5.—L. F. F., a man aged 28, first experienced difficulty in chewing in the spring of 1942, when he was 26 years of age. About a month after the first symptoms he noted weakness of the upper arms, so that he had difficulty in raising his hands above the level of his shoulders; within a week or two this weakness was followed by dysphasia, dysarthria and ptosis. His voice became nasal in character and he had regurgitation of liquids through his nose. For a few months after the onset the symptoms tended to come and go, but by June 1942 he had to change the character of his work from a molder in a factory to a less arduous occupation. In September 1942 he had to give up work altogether. He responded rapidly to neostigmine injection and was maintained on an intake of about 10 tablets of neostigmine bromide a day. On numerous occasions his intake had to be increased to double the amount prior to his thymectomy. Although the course of the disease had not been entirely steady, in general he did not have serious remissions or relapses. At operation, Sept. 27, 1943, about one and one-half years after the onset of his symptoms, a thymoma was disclosed in the lower pole of the right side of the thymus (fig. 6). The tumor had not definitely been disclosed by x-ray prior to the operation. The thymus weighed 40 grams and the tumor on microscopic section showed compact masses of thymic tissue (fig. 7). The patient was not improved immediately by the operation, for he required between 18 and 22 tablets of neostigmine bromide a day. About a month after operation, however, he was able to shave himself and could hold his hands straight in front of him with the fingers extended, a test that he could not perform before operation. His schedule of neostigmine bromide was gradually reduced to 14 tablets a day, but he was never able in the eight months following operation to maintain himself on a smaller intake. In June 1944 he found it difficult to hold his arms above his head, his voice was nasal in character and he was unable to work. His condition was possibly 25 per cent better than before operation.

Tumors of the thymus may show by x-ray. We have a number of examples in our series in which the tumor disclosed itself in both the anteroposterior and the lateral views. It is often particularly well visualized in lateral views of the anterior mediastinum. Not all tumors, however, in this area are thymomas, and it is known that some patients have had thymomas removed who have not had a definite history of myasthenia gravis. An examination of one or two records of patients thought to be of this type may reveal signs of muscular weakness, overlooked as symptoms of myasthenia gravis.

We are not in a position, as suggested by some, to advocate thymectomy in every case of myasthenia gravis. There is, for instance, a fairly large group of patients, about 25 per cent of the entire series, who do remarkably well on a moderate amount of neostigmine medication or who have prolonged and even complete remissions. This group should not be subjected to thymectomy, particularly in view of the fact that the operative mortality is at the present time between 20 and 25 per cent. Secondly, we now make a diagnosis of myasthenia gravis, as a result of the refined technic of the diagnostic test with neostigmine, in patients in the older age groups, particularly above 50 years of age. In my clinic 30 per cent of the 125 patients under observation were over 50 years of age at the time of their initial symptoms. This group also in most instances should not be treated by thymectomy.

The difficulties in evaluating the results of thymectomy are many. The progress of the disease is often punctuated by rapid remissions, in many cases complete in character. The thymus, moreover, is not known to have a specific function, at least in the adult. Even the presence of thymomas does not mean that there is any effect on the body from this neoplastic tissue. Finally one must wait for many years before a critical decision can be made with regard to the thymectomy problem. At the present time we are still in the experimental stage, with slight but definite indications, however, that there is some relation between the thymus and myasthenia gravis.

SUMMARY

In the course of the last eight years 125 cases of myasthenia gravis have been studied at the Massachusetts General Hospital. A separate outpatient clinic was established in 1935 and about 60 cases are followed in this clinic constantly.

Neostigmine was first used by us in March 1935 and has continued to be the principal drug used in the treatment of myasthenia gravis. Neostigmine is useful also as a means of diagnosis, and the diagnostic test, first described in 1935 and made more definitive in 1938, has proved to be of value.

The study of the swallowing reflex before and after neostigmine injection is the most reliable diagnostic test.

The development of the theory of chemical mediation in the transmission of nerve impulses across a synapse has led to the assumption that the inhibition of cholinesterase by neostigmine allows the acetylcholine to remain at the myoneural junction and form the chemical connecting link between the nerve impulses and the muscle. Treatment is therefore based essentially on the giving of neostigmine in sufficient amounts to make the transmission of the impulse efficient. The exact amount of neostigmine needed for this varies greatly. Patients are maintained on doses of a few milligrams of neostigmine taken by mouth in twenty-four hours up to an intake as high as 31 mg. of neostigmine methylsulfate, given in hourly doses, throughout the day and night.

Neostigmine methylsulfate may be given intravenously.

Large amounts of neostigmine are needed by patients seriously ill; the neostigmine requirement rises in increasing ratios in relation to the severity of the illness.

Three other drugs have a place in the treatment of myasthenia gravis: ephedrine sulfate, potassium chloride and guanidine hydrochloride.

Removal of the thymus may relieve some of the symptoms of myasthenia gravis. A few of the patients studied have shown complete remission after operation; others are unchanged. Patients with thymomas do not do better after operation than patients whose thymus appears normal on section.

Progress is being made along many fields in the study of myasthenia gravis. The greatest advances are pharmacologic, although an increase in our knowledge of the disease, both from the clinical and from the surgical point of view, is evident.

262 Beacon Street.

ABSTRACT OF DISCUSSION

DR. F. G. LINDEMULDER, San Diego, Calif.: I should like to ask Dr. Viets what his experience has been with high voltage x-ray therapy on the thymus.

DR. HENRY R. VIETS, Boston: Our experience with high voltage x-ray therapy is limited to 15 cases. We have tried to treat the region of the thymus. Some have had five or six applications of 500 or 600 roentgens on two or more occasions. In no case have I seen evidence of any effect from this treatment on the symptoms of myasthenia gravis. This is contrary to some reports in the literature, but I can simply speak for our experience. We have given up x-ray treatment.

THE TRANSFUSION OF CENTRIFUGED HUMAN TYPE O CELLS

RESUSPENDED AND STORED IN 10 PER CENT CORN SYRUP

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In the past few years there has been a growing use of suspensions of red blood cells for transfusion of selected patients. With the preparation of plasma in many hospital blood banks and the extensive American Red Cross blood procurement program for the armed forces, huge amounts of centrifuged cells remain after the plasma has been withdrawn from the whole citrated blood. Until the comparatively recent and more extensive use of some of these cells for transfusion of patients suffering mainly from anemia, most of these cells have been discarded.

It is now recognized that the transfusion of red blood cells can serve as well as whole blood for many patients. The main problem has been to find a solution for resuspension which will preserve the cells for a long enough time to make their use practical. Isotonic solution of sodium chloride has been used extensively but is far from ideal, in that it is necessary to administer the saline-suspended cells not later than five days after the blood is obtained from the donor. Various citrate-dextrose solutions, which are excellent for storing whole blood, are not as satisfactory when used for resuspending centrifuged cells.

Since it was evident that a better solution was needed, this study was undertaken in an attempt to find one. The background has been an extensive experience with the transfusion of cells resuspended in isotonic solution of sodium chloride. Cooksey [1] in Detroit has followed 18,000 such transfusions in fourteen hospitals, and in New York we have reports on 2,000 out of 5,000 such transfusions administered in eight hospitals.

The value of any method for storing resuspended cells for transfusion must be estimated according to a number of criteria:

1. The solution used and its mixture with cells must be harmless.

2. The clinical response, which is the ultimate criterion, must be comparable to that from transfusions of fresh whole blood.

3. The survival in recipients of the transfused cells must compare favorably with survival of transfused fresh blood.

It was found that 10 per cent corn syrup in distilled water gave better preservation of cells for a longer time than any of the other solutions tried, i. e. Alsever's, Denstedt's and various mixtures of different proportions of dextrose, sodium citrate, sodium chloride and phosphate buffer. The freezing point of the 10 per cent corn syrup solution is the same as that of 0.85 per cent sodium chloride, and in behavior it appears to be isotonic or very slightly hypertonic for blood cells.

The corn syrup solution was investigated with the idea that the dextrins contained might, because of their larger molecular size, function somewhat as the original plasma in maintaining the stability of the stored, resuspended cells.

This report is based on 761 transfusions of centrifuged type O cells resuspended and stored in 10 per cent corn syrup up to sixty days and administered to 437 patients, many of whom received repeated transfusions, some daily and some several times a week.[2] These patients had a variety of chronic diseases, such as arthritis, Hodgkin's disease, various types of leukemia, nephritis, pulmonary tuberculosis, inoperable cancers and neurologic conditions. A number of the aforementioned patients had demonstrable anemia, and 1 patient had an acute and massive blood loss from a bleeding gastric ulcer; also some patients with various acute conditions received cells.

The clinical improvement has been what could be expected from the administration of the same amounts of whole blood of the same age, and the same increase in the patients' total red blood cell count and nonagglutinable (transfused type O cells) red blood cells occurred. Careful observation revealed no unusual or deleterious effects, a low fever-chill reaction rate and the absence of hemoglobinemia, hemoglobinuria or jaundice in any of the patients.

Unfortunately, no one has published an in vitro test of the stability of blood cells which can be correlated with the ability of these cells to survive in the circulation after they have been transfused. If such a test could be found it would be of extreme value.

From the American Red Cross Blood Donor Service and Public Health Research Institute of the City of New York, Inc.

1. Cooksey, W. B., and Horwitz, W. H.: Use of Salvaged Red Cells, J. A. M. A. **124**: 961-964 (April 1) 1944. Taylor, E. S.; Thalhimer, W., and Cooksey, W. B.: The Organization of a Red Blood Cell Transfusion Service, ibid. **124**: 958-960 (April 1) 1944.

2. Up to Dec. 31, 1944 3,400 cell transfusions had been given.

METHOD OF PREPARING THE CELL SUSPENSIONS

The cells have been obtained from the blood of voluntary donors enrolled at the Blood Donor Center of the American Red Cross in New York City. Five hundred cc. of blood is taken by gravity into bottles containing 50 cc. of 4 per cent trisodium citrate solution. The blood types are determined from samples obtained from the pilot tubes. Only type O blood is selected.

The typing is carried out on large glass plates, using two sets of high titered, quick acting typing serums. The tests are read independently by two experienced technicians.

The bottles are then delivered to the processing laboratory, where serologic tests are made, the bottles centrifuged for about one hour at 2,500 revolutions, and the plasma withdrawn for processing into dried plasma. Sterile, solid rubber stoppers are placed in the bottles containing the cells and the bottles are then refrigerated until they are ready for resuspension of the cells, thirty-six to forty-eight hours after the blood was obtained. Only blood that is serologically negative and of a low fat content is used. Two hundred and fifty cc. of prechilled (5 C.) 10 per cent corn syrup in sterile, pyrogen free distilled water is introduced into each bottle with a careful bacteriologic technic, the work being done in a dust free cubicle. The volume is restored to approximately that of the original blood. The composition of the corn syrup [3] before it is diluted is dextrose 17.7 per cent, maltose 16.8 per cent, higher sugars 16.2 per cent, dextrins (prosugars) 29.6 per cent and moisture 19.7 per cent.

The bottles are placed in small wooden refrigerator boxes for delivery to the hospitals. The cells are not administered to patients until at least three days have elapsed after withdrawal of the blood. No pilot tube is sent with the bottle, and the hospitals are required to retype the cells from the original bottle and perform cross matching tests with the recipient's blood. The suspended cells must be transfused within five hours after the sample for testing has been taken from the bottle.

Before administration the bottles must be sufficiently agitated to make an even suspension of the cells and free those that might be adhering to the bottom and sides of the bottle.

The mixture is then filtered, immediately before use, through four to eight thicknesses of sterile 40 by 40 bandage gauze or through a 100 to 200 mesh filter inserted into the infusion set. It is unusual to find more than a few small clots on either filter; as many as six bottles of cells have passed through a single steel mesh filter. The cell suspension is not warmed before use.

The type O cells have been administered to recipients of all four blood groups, and no incompatibility reactions have occurred. The hospitals have been cautioned not to use these cells for transfusing women who are either pregnant or in the postpartum period without making certain that there is no incompatibility because of the Rh factor. In case of doubt only Rh negative cells should be administered. The same caution should be observed with all patients who receive repeated cell transfusions.

Before the clinical use of either saline solution or 10 per cent corn syrup suspended cells was begun, careful tests were made to determine the sterility of the bottles of cells. Negative cultures were first secured on fifty bottles, and then on the first three hundred which were transfused. Since then cultures have been taken each week of several bottles selected by chance; no contaminations have been found.

CLINICAL RESULTS AND SURVIVAL OF THE TRANSFUSED CELLS

A review of the literature [4] indicates that fresh blood transfused into persons who do not destroy blood at a rate greater than normal disappears from the circulation in about one hundred days at the approximate rate of 1 per cent daily. It seems obvious that the oldest cells die first.

Blood kept outside the body under equally good conditions can be expected to age at the same rate. If kept under less favorable conditions (as with citrate alone) the cells should die and disappear after transfusion at a greater rate. It is conceivable that favorable resting conditions might be found to conserve the viability of the cells.

The length of survival of transfused cells has been followed by the well known method of Winifred Ashby.[5] This method is based on the principle that when type O blood or cells are transfused into a recipient belonging to type A or B one can differentiate the nonagglutinable O cells from the A and B cells by means of the proper agglutinating serum.[6] We adhered closely to Ashby's original technic, after trying other modifications of this and not securing consistent results and accurate checks. We have found, in addition, that we secure closer checks with finger stick blood than with venous blood in which clotting is prevented by a mixture of ammonium and potassium oxalate.

Blood is taken into a red cell blood diluting pipet up to the 0.5 mark and the pipet is then filled to the upper mark with the proper high titered agglutinating serum, which also has great avidity. The counts are always done in duplicate, two blood pipets being used. The filled pipets are shaken for five minutes on a shaking machine and then allowed to stand for at least one hour at room temperature. They are again shaken on the shaking machine for five minutes, and, when taken off, samples are quickly placed in the blood counting chambers. Time is allowed for the cells to settle. The unagglutinated cells which occur singly are then counted in two large squares, each a millimeter square, so as to count a large area and reduce the error of counting to a minmum. Unless the counts of the individual squares are sufficiently close together, the whole procedure is repeated.

With this technic we have made counts of a number of mixtures in vitro with different proportions of fresh citrated A blood and fresh suspended O cells. Total red cell counts, as well as nonagglutinable cell counts, were done on each of these separately and on the mixtures. These results show an unavoidable error in counting the nonagglutinable cells of not more than 10 per cent. There is, of course, an unavoidable error in regular red blood cell counting. The best technicians cannot avoid an error of about 200,000 per cubic millimeter in counting total red blood cells, which would be

3. The corn syrup was furnished by the Corn Products Refining Company, and Dr. Haldane Gee of the Sterisol Company prepared the 10 per cent solution.

4. Wearn, J. T.; Warren, S., and Ames, O.: The Length of Life of Transfused Erythrocytes in Patients with Primary and Secondary Anemia, Arch. Int. Med. **29**: 527-538 (April) 1922. Mollison [8] and others.

5. Ashby, Winifred: Determination of the Length of Life of Transfused Blood Corpuscles in Man, J. Exper. Med. **29**: 267-282, 1919.

6. M or N cells and anti-M or anti-N agglutinating serums can be used just as satisfactorily, as carried out by Schaefer and Wiener.

4 per cent when the total is 5,000,000, and 10 per cent when it is 2,000,000.

It must be remembered that with this technic every individual belonging to type A or B will show a small number of cells which are not agglutinated by the agglutinating serum. These will vary in different individuals from about 10,000 to not more than 100,000 per cubic millimeter. Therefore these initial nonagglutinable cell counts must be taken into consideration and subtracted from the nonagglutinable cell count in the mixtures and after the transfusion of type O cells. Total red blood cell and nonagglutinable cell counts were made before transfusion, immediately after and then at intervals. The percentage of survival was calculated on the basis of the net nonagglutinable cell count immediately after transfusion.

Two hundred and fifty-three consecutive nonagglutinable cell counts which have been done in duplicate on type A and B patients who were transfused with

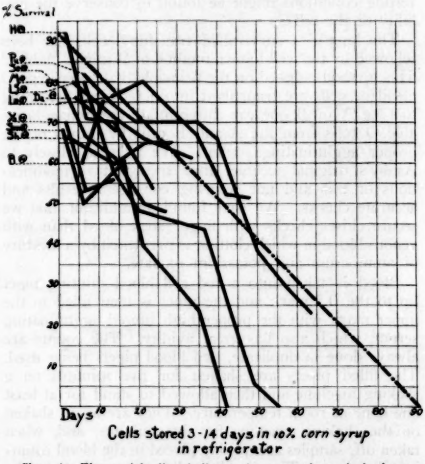

Chart 1.—The straight line indicates the expected survival of transfused whole blood after refrigerator storage in an accepted dextrose citrate mixture for seven days. The survival is given in percentage of the transfused cells in the recipient's circulation immediately after transfusion and at intervals in days. Number of days' storage, before transfusion, given in the circles.

type O cells have been analyzed. The average difference between these duplicate counts has been 14,000 nonagglutinable cells per cubic millimeter. The average of the duplicate counts was the figure recorded.

Before transfusing cells suspended in 10 per cent corn syrup into human beings a long series of in vitro and animal experiments was carried out. It was demonstrated repeatedly that cells in 10 per cent corn syrup were more stable and less fragile at the end of three weeks' storage at 5 C. than were cells suspended in isotonic solution of sodium chloride after five days, and more stable than cells kept in Alsever's or Denstedt's solutions for the same periods of time. The amount of hemoglobin in the supernatant fluid averaged 100 mg. per hundred cubic centimeters at the end of five days' storage in saline solution and from 30 to 40 mg. per hundred cubic centimeters at the end of three weeks in 10 per cent corn syrup.

Rabbits received repeated injections intravenously of large amounts of 10 per cent corn syrup, as many as twenty in forty days, and also of rabbit cells which had been preserved in corn syrup for from one to four weeks. These injections did not cause any detectable deleterious effects in the animals. Microscopic examination of their tissues later by Dr. Jean Oliver showed no pathologic changes and no deposits of iron pigment.

Several years ago Dr. Francis D. Murphy of Milwaukee administered from 200 to 300 cc. of 50 per cent corn syrup solution intravenously to patients with increased intracranial pressure resulting from hypertension. This solution sent to him was prepared from the same brand of syrup. Some reduction of the intracranial pressure followed, and there were no deleterious or harmful effects from these large quantities of corn syrup.

Dr. R. E. Shaw of King Edward VII Memorial Hospital, Bermuda, in a personal communication states that although they formerly used a 10 per cent dextrose solution for intravenous infusion, for the past five years they have been using 10 per cent corn syrup instead and have had identical beneficial results. He also writes that "there has never been any untoward reaction from this solution."

In the beginning only small amounts, 50 to 75 cc., of fresh corn syrup suspended cells were administered intravenously, to make certain that the corn syrup or the mixture would not produce any harmful effects. The amounts were gradually increased up to 500 cc. per injection. Later a number of patients received 1,000 cc. in one injection, and several patients have received 3 liters in three days' time. One patient, with a bleeding gastric ulcer, received 3.5 liters in seven days.

Three hundred and eighty-two transfusions of type O cells resuspended in 10 per cent corn syrup have been administered to 125 different patients at Montefiore Hospital in the medical service of Dr. Louis Leiter. Some of these transfusions have been with fresh cells, 3 days old, but many of them were with cells 7, 14, 22 and 24 days old; two were with 31 day, one with 38 day, one with 41 day and one with both 50 and 60 day old cells.

The administration of these cells to these patients can be considered a severe and practical test. In the main the recipients were those who needed cells and hemoglobin, many of them with diseases causing anemia and increased blood destruction. Some patients, i. e. those with arthritis and neurologic conditions, had normal blood counts, and the transfused cells created a luxus which these recipients could be expected to remove from their blood stream, yet the survival of the cells was remarkably good in most individuals. Survival studies are recorded in charts 1 and 2.

It has been found that the survival of transfused cells drops off sharply when they have been stored for longer than twenty-four days. Cells in 500 cc. amounts which have been stored for thirty, forty, fifty and sixty days have been transfused to compare their survival with published results of survival of transfused whole blood stored for the same intervals. The survival was essentially the same, and, in addition, these old cells caused no deleterious effects, no jaundice and no hemoglobinuria. Although from 20 to 40 per cent survived in the patients' circulation for from two to ten days, it would hardly be advisable or necessary to transfuse cells stored thirty days or longer, except for an emergency or if fresher material was not available.

Although the results with transfusion of 21 day old cells have been just as satisfactory as those we and others have obtained with whole blood stored in dextrose-citrate solution for the same interval, nevertheless for the present a fourteen day expiration date has been established.

Four cases which show clinical benefit and absence of jaundice, after very large volumes of transfused cells, are reported:

B., a man with type A blood, who had aleukemic leukemia, in eighty-six days received 21 transfusions, a total of 14 liters, 14 of 500 cc. each and 7 of 1,000 cc. amounts. Most of this had been stored for from eighteen to twenty-two days. In one eighteen day period he received 9.5 liters of 18 to 22 day old cells. His red blood cell count was raised from 1½ to 3 million. Obviously he was destroying cells rapidly, yet he never showed any jaundice. For over a month, though he belongs to type A, his blood mixed with potent B serum showed no clumping, and both total red blood cell count and nonagglutinable count were practically identical, differing by 100,000 to 200,000. Therefore he produced very few, if any, red blood cells of his own and has been living on transfused cells.

P., a man with type AB blood, who had myeloid leukemia, in thirty-seven days received 21 transfusions, a total of 13.5 liters, 6 transfusions of 1,000 cc. amounts and the others of 500 cc. One 500 cc. transfusion was of 38 day old cells, and the next day he received 1,000 cc. of 39 day old cells. The age of the other transfusions varied from 4 to 24 day old cells. The last 12 transfusions were of 4 to 5 day old cells, and yet his red blood cell count could not be raised above 2,000,000 per cubic millimeter. Total and nonagglutinable cell counts were practically identical. Although he has been destroying large amounts of the blood he received he never has had jaundice.

L., a man with type A blood, who had aleukemic lymphatic leukemia, received 14 transfusions of cells from 4 to 38 days old, a total of 9.5 liters in thirty-five days. He has never had any jaundice. His total red blood cell count was raised to almost 4,000,000 and his nonagglutinable count to about half of this. Therefore he has been producing some red blood cells of his own.

W., a man with type B blood, entered the hospital with an actively bleeding gastric ulcer, a hemoglobin of 4 Gm. per hundred cubic centimeters and red blood cell count of 1,140,000. In twenty-one days he received 11 cell transfusions, 3 of them (2,500 cc.) of saline suspended cells and the remainder of corn syrup suspended cells, the last 3 transfusions being of cells 7, 14 and 20 days old. His ulcer stopped bleeding, the hemoglobin rose to 14 Gm. per hundred cubic centimeters, and red blood cells to 4,840,000. He left the hospital three weeks after the last transfusion with a hemoglobin of 14 Gm. and red blood cells 4,540,000. Seventy-one days after his last transfusion he returned to the hospital for observation. The red blood cell count was 4,840,000 and his nonagglutinable cell count was 790,000. The calculated survival of only the corn syrup suspended cells which he received was 604,000. This did not include any of the saline suspended cells which might have survived. These two figures are reasonably close. This case report also demonstrates that a patient suffering from massive blood loss benefits from transfusions of resuspended cells and his blood count can be brought to normal and, after the bleeding has ceased, remain normal.

Dr. Nathan Rosenthal has administered 192 red cell transfusions to 150 patients at Mount Sinai Hospital. His experience has paralleled that just reported. None of his patients developed jaundice. In addition he carried out quantitative studies of urobilin output in 3 patients before and after transfusion of cells. Two patients received 500 cc. and 1,000 cc. respectively of cells that were 8 days old, and one 500 cc. of cells that were 13 days old. There was no increase in the rate of urobilin output (stools and urine) in any of these 3 patients.

About 20 bottles of cells in cardboard cartons and without refrigeration were sent by airplane to Bermuda and were administered there by Dr. R. E. Shaw when the cells were from 5 to 10 days old. The usual benefit resulted, and these patients developed no reactions or jaundice.

Cells suspended in 10 per cent corn syrup were next substituted for saline suspended cells at New York Hospital, with similar good results. These four hospitals have previously had a long experience with cells suspended in isotonic solution of sodium chloride and now prefer to use cells suspended in 10 per cent corn syrup. Because of the longer keeping qualities of the cells a supply can always be maintained. Since Sept. 1, 1944 from 150 to 200 bottles of cells in corn syrup have been delivered every week to eight hospitals in New York City, instead of saline suspended cells which were distributed previously.

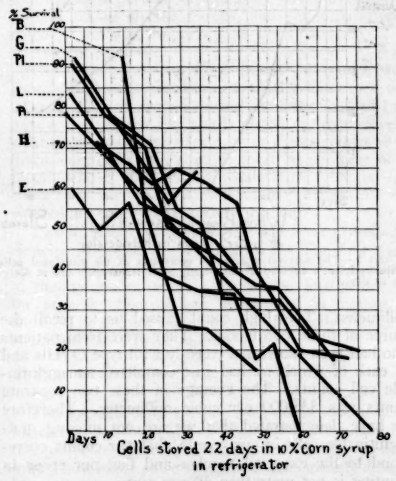

Chart 2.—The straight line indicates the expected survival of transfused whole blood after refrigerator storage in an accepted dextrose citrate mixture for twenty-two days. The survival is given in percentage of the transfused cells in the recipient's circulation immediately after transfusion and at intervals in days.

Our counts show that the average net increase in nonagglutinable cells immediately after transfusions of 500 cc. of type O cells suspended in corn syrup in 14 patients is 418,500 cells per cubic millimeter. Clinical experience has shown that a transfusion of 500 cc. of blood into an anemic adult of average size causes an increase in the individual's red blood cell count of about 400,000 per cubic millimeter. Therefore our nonagglutinable cell counts check very well with regular red blood cell counts.

On two occasions high nonagglutinable cell counts were found in patients (1 type A and 1 type B) who were believed not to have had a previous transfusion of type O cells. Each showed, before our transfusion, a nonagglutinable cell count of about 350,000 per cubic millimeter. It was then discovered by investigating the histories of the patients that each had received transfu-

sions of O cells suspended in saline solution about two weeks previously.

On another occasion the accuracy of our counting was tested with an in vitro mixture of two samples of citrated A blood and some O cells, as already described. A mixture was made of equal parts of the citrated blood from each of these two type A patients, and the total red cell and nonagglutinable cell counts made. The nonagglutinable cell count was 340,000 per cubic

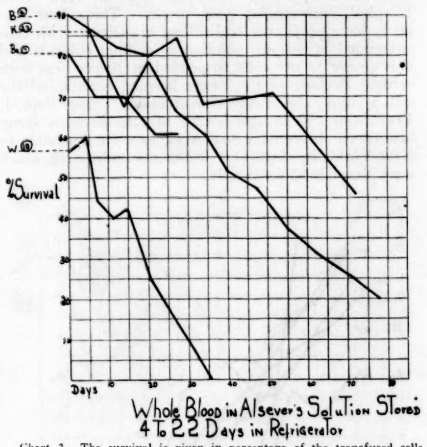

Chart 3.—The survival is given in percentage of the transfused cells in the recipient's circulation immediately after transfusion and at intervals in days.

millimeter. This high count caused us to recall the source of these two bloods. They were from patients who had been transfused recently with type O cells and on each of which we had just completed nonagglutinable cell counts. The average of these two separate counts was 335,000 per cubic millimeter. Therefore we have demonstrated that we are not missing nonagglutinable cells in our counts, that our counts correspond to the expected number and that our error in counting is not more than 10 per cent.

Mollison has demonstrated that when fresh whole blood preserved in dextrose-citrate mixtures is transfused into individuals who do not destroy blood at a greater than normal rate, some of the cells will survive approximately one hundred days. He has found that the rate of destruction is about 1 per cent a day; when charted as percentage of survival against number of days after transfusion, a straight line will result. If blood is preserved in the refrigerator for a number of days before it is transfused, the percentage of cells which disappear in the first twenty-four to forty-eight hours will correspond approximately to the number of days the blood has been stored. For example, if blood has been stored for fourteen days one can expect that only about 86 per cent will survive during the first one or two days after transfusion. From then on the rate of disappearance will be about 1 per cent a day.[7] This information has been gathered from the figures and curves in Mollison's [8] and Denstedt's [9] publications. This has been confirmed also in this study by survival studies after transfusion of blood collected in Alsever's solution and stored up to twenty-one days before administration. Apparently this has not been recognized, as one not infrequently finds the statement that blood preserved in certain solutions for fourteen days will survive as well as fresh blood. The curves of survival which we have obtained demonstrate that centrifuged cells that have been resuspended in 10 per cent corn syrup survived at least as well after transfusion as whole blood which we collected in Alsever's solution and stored for similar periods (chart 3), and as reported by Denstedt and Mollison for blood collected in other dextrose-citrate mixtures. Survival was found to be considerably longer than whole blood collected in citrate alone and stored for the same or even shorter periods.

The survival of transfused cells that had been stored in isotonic solution of sodium chloride for from three to eight days was also followed (chart 4). It can be seen that the survival in most instances was much less than with corn syrup suspended cells, although several times the survival was very good. These results do not indicate that the transfusion of saline suspended cells has no value but merely that they are not as efficient as cells stored in 10 per cent corn syrup. Also wide clinical use has demonstrated a real benefit to patients who have received saline suspended cells intravenously. All transfused cells, regardless of the preparation used for suspension, have a double value: first, while the cells remain intact, they supply oxygen-

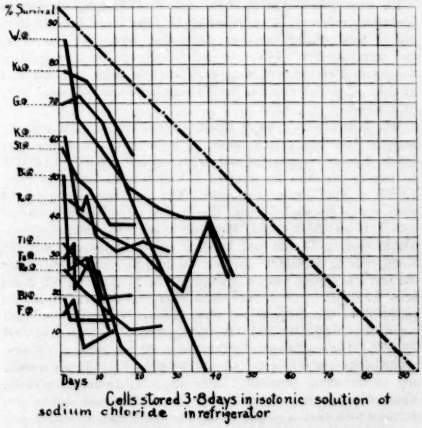

Chart 4.—The straight line indicates the expected survival of transfused whole blood after refrigerator storage in an accepted dextrose citrate mixture for five days. The survival is given in percentage of the transfused cells in the recipient's circulation immediately after transfusion and at intervals in days. Number of days' storage, before transfusion, given in the circles.

carrying capacity to the blood; and, second, when they break down, they supply to the patients' hemopoietic

7. At times, however, although survival of transfused cells in the recipients' circulation will be at the expected level for one or two days, after this the cells will disappear at a greater than expected rate.

8. Mollison, R. L.: The Survival of Transfused Erythrocytes in Hemolytic Disease of the Newborn, Arch. Dis. Childhood **18**: 161-172, 1943. Mollison, P. L., and Young, I. M.: On the Survival of the Transfused Erythrocytes of Stored Blood, Quart. J. Exper. Physiol. **30**: 313-327, 1940.

9. Denstedt, O. F.; Osborne, D. E.; Stansfield, H., and Rochlin, I.: The Survival of Preserved Erythrocytes After Transfusion, Canad. M. A. J. **48**: 477-486, 1943.

system degradation products which can be rapidly utilized in the elaboration of new hemoglobin.

We have also found, as have Denstedt and Mollison, that some whole bloods do not survive as long as expected after transfusion, whereas others survive longer than expected. Therefore the results with a single transfusion of blood or resuspended cells may be misleading. Only when a sufficiently large number of transfusions are followed in a series of patients will these differences of survival balance and a true average survival rate be determined.

SUMMARY

1. After citrated blood has been centrifuged and the plasma withdrawn, the cells which remain have been resuspended in isotonic solution of sodium chloride and have proved useful for transfusing selected patients, especially those with anemia from a variety of causes.

2. A 10 per cent solution of corn syrup in distilled water has been found to be an excellent medium for resuspending centrifuged cells. Cells stored in it remain in good physical condition longer than in isotonic solution of sodium chloride and other solutions which were tried. They remain less fragile to hypotonic saline solution and much less hemoglobin is found in the supernatant fluid.

3. Single and repeated intravenous injections of large amounts of 10 per cent corn syrup solution have proved innocuous to rabbits and to human beings.

4. Seven hundred and sixty-one transfusions of centrifuged cells resuspended in 10 per cent corn syrup have been administered with satisfactory results to 437 patients and have not produced jaundice or other deleterious effects. The nonspecific fever-chill reaction rate has corresponded in the different hospitals to that from their own bank blood.

5. These resuspended cells have been used for transfusion after storage at 5 C. for as long as twenty-one days, but for routine use an expiration interval of fourteen days has been established.

6. Using Ashby's agglutinating technic, observations have been made on the survival of these cells in a variety of patients. Similar comparative observations have been made on whole blood in citrate-dextrose mixtures and on cells suspended in isotonic solution of sodium chloride.

7. Centrifuged cells resuspended in 10 per cent corn syrup survived as well and as long in the recipient's circulation as whole blood in a dextrose-citrate mixture stored for the same length of time and longer than cells in isotonic solution of sodium chloride. When only cells are needed, the clinical results also indicate that a transfusion of centrifuged cells resuspended in 10 per cent corn syrup is as satisfactory as a transfusion of whole blood.

111 East Eightieth Street.

Medical Lore.—The works of two Arab or, rather, Persian physicians of the Eastern Caliphate were the fountainhead of medical lore. Al Rhazi, better known as Rhazes (860-932), was the first very great physician, and the canon of Iban Sinna, or Avicenna (980-1036), dominated European medicine for five centuries. The writings of both were available in Arabic, of course, and there were Hebrew translations. Ali al-Tabari, a Moslem convert and court physician to the Caliphs, was the teacher of Al Rhazi; the father of the convert, also a court physician, was the first to translate the Almagest into Arabic.—Wechsler, I. S.: The Neurologist's Point of View, New York, L. B. Fischer, 1945.

PROTEIN DEFICIENCIES IN PREGNANCY

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The term protein deficiency, the definition of which is obvious, is to be preferred to the more commonly used term hypoproteinemia for at least two reasons. In the first place the term hypoproteinemia makes no provision for the degrees of protein depletion, which are of importance even when they are not sufficiently pronounced to lower the circulating proteins to the level of hypoproteinemia. In the second place hypoproteinemia, from the standpoint of etymology, concerns only the circulating protein of the blood, which is now believed to be less important in the body economy than the protein depots in the tissues, and the reparation of which is fully as important as the reparation of the circulating protein.

The Food and Nutrition Board of the National Research Council recommends a daily allowance of at least 85 Gm. of protein during the latter half of pregnancy and regards two thirds of the optimum level as a minimum subsistence level. For the purposes of this discussion, diets which fail to meet 50 per cent of the recommended optimum daily allowance, that is, diets containing less than 42.5 Gm., are arbitrarily considered as deficient in protein content.

Two questions invariably arise whenever protein deficiencies in pregnancy are discussed. The first has to do with the incidence of such deficiencies as the result of dietary inadequacies. The second has to do with the possible effect of such deficiencies on mother and child. The present communication is chiefly an attempt to answer those two questions.

INCIDENCE OF PROTEIN DEFICIENCIES IN PREGNANCY

The average daily antepartum protein intake of 400 unselected patients (225 of whom have previously been the subject of report [1]) was estimated, and it was determined how many patients ingested diets grossly deficient in protein content. By this method a reasonably accurate determination was obtained of the incidence of protein deficiencies due to dietary inadequacies during pregnancy.

Fifty of the 400 subjects were private (white) patients; 350 were clinic patients, of whom 150 were white and 200 Negro. The distribution of material afforded the opportunity for comparative studies of diet in groups of patients who were representative from the standpoint of race, economic status and intelligence but who were otherwise unselected except that none of them presented any obvious complications of pregnancy.

The dietary data were secured, analyzed and calculated by trained nutritionists, who employed a standard

This study was made possible by the cooperation and technical assistance of the Dietary Department of the New Orleans Charity Hospital.

Read before the Section on Obstetrics and Gynecology at the Ninety-Fourth Annual Session of the American Medical Association, Chicago, June 14, 1944.

From the Department of Obstetrics and Gynecology of the School of Medicine of Louisiana State University and of Charity Hospital of Louisiana at New Orleans.

1. Arnell, E. E.; Guerriero, W. F.; Goldman, D. W.; Huckeby, Eleanor, and Lutz, A. M.: Protein Malnutrition in Pregnancy, New Orleans M. & S. J. 95: 114-127 (Sept.) 1942.

method of procedure based on each patient's estimate of the protein included in her diet. Since data based on the intelligence, truthfulness and cooperation of patients are naturally subject to human error, the results of these estimates were checked in a control group of 20 patients who were hospitalized and were fed diets having a known protein content. When the actual was compared with the estimated intake, the mean error was found to be only 4.1 ± 4.0 Gm.

As a matter of fact, no high percentage of error was expected, for protein, of all nutrients, is most readily studied by evaluation of the intake. Its metabolism is unique, and no other element of the diet can be utilized to supply it; it must be ingested as such. The sources of protein are limited and well known, so that even unintelligent patients can estimate with relative ease and accuracy the quantities ingested of the more important protein foods, such as meat, eggs and milk. The use of ration coupons for the purchase of certain protein foods has further emphasized what these foods are. Finally, computations are relatively simple because the composition of protein in the same food source varies so little.

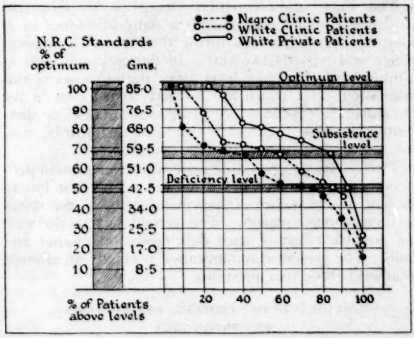

Fig. 1.—Protein intake of 400 pregnant women compared with National Research Council standards.

When the average daily protein content of the diet of each of the 400 patients studied was estimated in grams (fig. 1), it was found that 72 patients, 18.0 per cent, had an intake of less than half of the optimum amount recommended for the latter half of pregnancy. These 72 women represented 6 per cent of the private patients (3), 14 per cent of the white clinic patients (21) and 24 per cent of the Negro clinic patients (48). When calculations were based on ideal weight rather than on total protein intake in grams, the results were much the same; 74 patients fell into the deficiency group, their daily intake of protein being less than 0.75 Gm. per kilogram of body weight, as against a desirable intake of 1.50 Gm. per kilogram.

Neither a high intelligence rating nor easy financial circumstances precluded the possibility of defective diets. The lowest protein intake, 15.5 Gm. per day, occurred in a Negro subject, but so also did the highest, 122 Gm. per day. Twenty-two per cent of private patients received the recommended daily amounts of protein, as compared with 10 per cent of white clinic and 6 per cent of Negro clinic patients, the average for each group being respectively 72, 58 and 49 Gm.

Since a qualitative as well as a quantitative deficiency may affect the nitrogen equilibrium of the body, it is recommended that proteins derived from animal sources constitute at least 65 per cent of the total protein intake. In this series the average for the whole group of patients was 69 per cent, which is somewhat above the recommended proportion, but for the group whose diet was deficient in proteins the average was only 57 per cent.

TABLE 1.—*Dietary Rating of 400 Pregnant Women in Relation to the Average Daily Protein Intake in the Latter Half of Pregnancy*

Rating	Protein, Gm.	Cases	Per Cent
Excellent	85 or more	38	9.5
Good	70 to 84	46	11.5
Fair	55 to 69	149	37.3
Poor	42.5 to 54	95	23.7
Very poor	Under 42.5	72	18.0

On the basis of the protein content, estimated in grams, the diets of these 400 women were classified, according to the usual arbitrary standards, as excellent, good, fair, poor and very poor. Less than 10 per cent of the 400 patients (table 1) had diets which could be classified as excellent, and almost four fifths consumed diets which were fair or less than fair in this important nutritional essential. The group described as very poor, whose daily intake was less than 42.5 Gm., which is half the recommended amount, will hereafter be termed the deficiency group.

THE RELATIONSHIP OF PROTEIN INTAKE TO CERTAIN LABORATORY AND CLINICAL DATA

It was a fairly simple matter to determine, by the methods stated, the incidence of protein deficiencies in pregnancy as the result of inadequate protein intake. To determine the possible effect of such deficiencies on mother and child was more difficult. Balance studies, the only exact method, are not practical in most cases, and two other methods were used, namely a study of the relationship of various levels of protein intake to certain laboratory and clinical data and a study of the protein consumption of a small group of selected patients who manifested evidences of protein deficiency.

Before proceeding to the results of these studies, certain facts should be emphasized:

1. While a pronounced deficiency in the protein intake can in itself readily produce a state of protein malnutrition, such a deficiency is often accelerated and amplified by other causes, all of which may be operative in pregnancy, and which include the increased requirements of the body during the latter part of pregnancy, at which period the protein requirement is from a sixth to a third more than under other circumstances; impairment of digestion, absorption or utilization of ingested protein and excessive loss of ingested protein because of vomiting, catharsis, diarrhea or proteinuria. In evaluating the results presented, it should be borne in mind that our studies have to do only with dietary factors and that an analysis of other factors might reveal deficiencies more numerous and of greater degree.

2. The processes of absorption and utilization of ingested protein vary in different individuals. Furthermore, as we and others have demonstrated, the utilization of protein within the body tends to be more complete when the intake is low than when it is normal or high.

3. The response of the protein reserve in the tissues to the increased demands of pregnancy is variable. A

high reserve can compensate for a deficient intake, but a depleted reserve cannot. At present there is no method of determining the protein content of the tissues, and we must depend on such indirect evidence as is supplied by the fate of the protein ingested. Protein which does not enter the circulation and is not excreted is presumed to be utilized in the building up of protein depots in the tissues. On the basis of such evidence the ratio of tissue proteins to circulating proteins has been estimated as approximately 30:1. If this estimate is correct, any decrease of plasma proteins implies a depletion of tissue proteins many times greater.

4. Racial differences play a part, the Negro, generally speaking, being more resistant to dietary deficiencies than is the white subject.

5. It does not necessarily follow that abnormalities which may be present in patients with deficiencies in their protein intake are due to those deficiencies.

6. The results which follow inadequate protein nutrition are neither so characteristic nor so dramatic as those which follow other types of malnutrition. Subclinical protein malnutrition, although exceedingly common, usually causes little more than a slow and insidious wasting away of all the tissues, with associated weakness and general ill health. A demonstrable hypoproteinemia may develop and edema may ensue, but subclinical effects are far more common. The proper evaluation of these various considerations will make clear that close correlation between the protein content of the diet and alterations in the composition of the blood cannot be expected and that a close correlation also cannot be expected between the protein factor and obstetric complications and conditions. The warning should also be given that, regardless of the implications of the results of these studies, the number of cases in each category is too small to warrant definite conclusions.

Laboratory Data.—A significant relationship (table 2) was usually found to exist between the serum protein concentration of the blood at term and the protein content of the diet during the latter half of pregnancy. The average concentration was lowest in the deficiency group of patients. Direct correlation of individual diets and individual serum protein concentrations was, however, impossible, and several high individual levels, including the highest concentration found (8.8 Gm. per hundred cubic centimeters) occurred in the deficiency group. The albumin-globulin ratios remained practically the same for all groups. It was interesting to observe that so-called idiopathic edema of demonstrable degree occurred in the deficiency group with a frequency (40 per cent) approximately four times greater than in the group whose daily protein intake was 70 Gm. or more.

TABLE 2.—*Relationship of Various Levels of Dietary Protein to Serum Protein and Hemoglobin*

Average Daily Protein Intake		Serum Protein		Hemoglobin *	
Rating	Gm.	Cases	Mean, Gm. per 100 Cc.	Cases	Mean, Gm. per 100 Cc.
Excellent	85 or more	25	6.7	38	11.1
Good	70 to 84	25	7.1	46	10.0
Fair	55 to 69	25	6.6	149	10.2
Poor	42.5 to 54	25	6.5	95	9.1
Very poor	Under 42.5	25	6.2	72	8.3
Total		125	6.6	400	9.6

* At term.

Although the total amount of circulating protein can be estimated by the determination of plasma volume by the dye method, the technic is difficult and it is not practical to repeat the test frequently in the same patient. Trends, however, can be determined by serial serum protein and cell volume determinations, the latter of which reveal the effects of hydremia and hemoconcentration.

TABLE 3.—*Relationship of Various Levels of Dietary Protein to Various Clinical Data*

	Protein Intake				
	Excellent	Good	Fair	Poor	Very Poor
Obstetric data (averages)					
Duration of pregnancy, weeks	39.3	40.1	40.5	40.2	40.2
Duration of labor, hours	8.8	11.2	12.9	9.0	10.9
Breast feeding, per cent of cases	76	85	84	80	80
Complications (per cent of cases)					
Preeclampsia	0	4.4	4.0	5.3	8.4
Maternal mortality	0	0	0	0	0
Maternal morbidity	2.7	4.4	8.1	10.5	13.9
Fetal mortality	0	2.2	2.0	4.2	5.5
Average weight gain, pounds	22.0	21.8	24.0	26.4	26.9
Average birth weight, pounds	7.2	7.4	6.9	7.5	7.0

The mean hemoglobin of the deficiency group, 8.3 Gm. per hundred cubic centimeters, was 26 per cent lower than that of the group whose protein intake was excellent (11.1 Gm. per hundred cubic centimeters). A direct correlation between individual diets and individual hemoglobin values was not possible, but it is of interest that 6 patients in the deficiency group had hemoglobin values of more than 12 Gm. per hundred cubic centimeters.

We are prone to forget that hemoglobin contains protein as well as iron and that deficiencies in either or both can cause anemia. It is true that the principal food sources of iron and protein are similar, but the components vary considerably in different foods. If a protein deficiency exists, the administration of iron will be without effect on the anemia until the protein deficiency also is corrected.

Clinical Data.—There was neither group nor individual correlation (table 3) between the various levels of protein intake in the last half of pregnancy and the duration of pregnancy. Women with average intakes of less than 55 Gm. daily actually carried their babies slightly longer than those with intakes above 69 Gm.

There was neither group nor individual correlation (table 3) between the dietary intake of protein and the duration of labor, though patients whose intake was excellent had on the average the shortest labors. Protein deficiency is known to lead to poor muscular tone, but this was not evident in our series.

The storage of nitrogen in the latter half of pregnancy, which depends on a sufficient intake of protein, is considered essential for adequate lactation. The onset of lactation in these 400 patients averaged 2.5 days after labor, but no correlation was evident between the protein intake of the various groups and the percentage of women nursing their children when observations were made at periods varying from five weeks to six months. In fact, willingness rather than any inherent ability or lack of ability on the part of the mother seemed the factor which determined whether or not the babies were breast fed. For obvious reasons the incidence of breast fed children was highest in the free services.

Considerable evidence points to a close relationship between protein metabolism and the specific toxemias of pregnancy, and our own experience is to the effect that

the patient who consumes adequate protein is not only less likely to develop toxemia but is also far more amenable to therapy if it should develop. These statements of course should not be interpreted as meaning that we consider protein malnutrition as the primary or the only factor in the causation of preeclampsia and eclampsia or that we believe that a diet adequate in protein content will of itself prevent or cure that condition. Our own evidence, however, proves the unwisdom of the habit, formerly general and still practiced in some quarters, of restricting meat and eggs in the diet of the pregnant woman in the belief that protein foods are one of the causes of toxemia. There was no instance of eclampsia in this series, but it is significant (table 3) that the highest incidence of preeclampsia was in the deficiency group.

A dietary investigation which we carried out in 62 cases of eclampsia suggests that protein deficiencies may be of etiologic significance in this condition and still further discredits the concept that high protein consumption is a cause of eclampsia and that limitation of protein intake may prevent it. Not 1 of the 62 patients had an optimum protein intake, and only 3 had a daily intake for the last trimester of pregnancy above the actual deficiency level, the range being 14 to 64 Gm. per day. In many instances dietary inadequacies which had existed over long periods of time were further aggravated during pregnancy by restriction of meat, eggs and milk, either self imposed or carried out on medical advice. Protein deficits were also increased by such obvious causes as proteinuria, vomiting and catharsis.

Serum protein determinations in 47 cases during the eclamptic stage showed, in spite of hemoconcentration at the time, an average concentration of 5.1 ± 1.10 Gm. per hundred cubic centimeters, which is definitely lower than the normal average. A rough correlation existed between the degree of edema and the serum albumin concentration, but otherwise it was not possible to correlate the protein intake with either the serum protein concentration or the degree of edema.

Subclinical nutritional deficiencies are of importance during pregnancy not only because they may culminate in actual deficiency disease but also because they lower the general as well as the specific resistance of the patient. Pregnancy and parturition, even when normal, place heavy strains on a woman, and the strain is many times increased by the development of complications and abnormalities and by the traumatic effects of operative delivery. The prognosis in such circumstances is often largely dependent on the nutritional status of the patient.

The proteins are of great importance in the chemical defense of the body against bacterial invasion. Recent investigations in acquired immunity suggest that antibody production is a phase of protein metabolism and that a protein deficiency will in time impair the maturation or preservation of the antibody mechanism, leading to loss of acquired immunity and increased susceptibility to infection. The same reasoning seems to hold for the production of toxins, antitoxins and antigens.

Our figures support the assumption that, in the past, too much attention has been focused on obstetric complications and abnormalities as causes of maternal and fetal mortality, and too little attention paid to the general nutrition of the patient. There was no maternal mortality in this series (table 3), but a significant relationship was found to exist between the maternal morbidity and the protein content of the maternal diet, the morbidity in the deficiency group being five times that in the excellent group. While factors other than protein deficiency may perhaps furnish part of the explanation for these phenomena, it should be emphasized that the background, so to speak, was the same for all groups, in that they were managed by the same general plan, by the same physicians and with a similar incidence of operative delivery.

Fetal mortality, including stillbirths and neonatal deaths, also bore a significant relationship to the maternal protein intake, though among babies who survived the general pediatric rating was essentially the same for all groups.

The average maternal gain in weight during pregnancy was greatest in the deficiency group (table 3). Some of the added weight can perhaps be explained by edema, but an analysis of the patients' food charts revealed a tendency, when the protein intake was low, toward high ingestion of carbohydrate and fat. It is reasonable to assume that protein foods satisfy appetites earlier than other varieties and therefore make one content with fewer calories. In this respect we have found diets high in protein of value for the restriction and reduction of weight during pregnancy.

The average fetal weight at birth was approximately the same in all groups, which supports the assumption that the fetus in utero is a true parasite, drawing nutrients from the mother, even to her detriment when this is necessary in the fetal interest. It also supports the assumption that at present no method is known by which the child's birth weight can be controlled by dietary means.

MASSIVE NUTRITIONAL EDEMA IN PREGNANCY: ANALYSIS OF CASES

Because subclinical protein deficiency is common but clinical deficiency unusual, we are presenting herewith a detailed study of 11 patients admitted to the hospital in the last trimester of pregnancy (8 of whom have already been the subject of report [2]) because of massive edema of obscure etiology. The tentative diagnoses on admission included toxemia in 6 cases, heart disease in 3 and nephrosis and anemia in 1 each. Further investigation showed the edema in all 11 cases to be due to a basic protein deficiency.

In order to exclude questionable or borderline cases from this category, the criteria by which these cases were selected were made deliberately high. They included:

1. Absence of the usual conditions responsible for edema in pregnancy, such as cardiac or renal disease, toxemias of pregnancy and mechanical or inflammatory factors.

2. The presence of an obvious deeply pitting edema of the lower extremities and the vulva.

3. A minimum loss of weight of 7 Kg. (15 pounds) from the beginning of treatment to the date of delivery. This loss, although selected arbitrarily, was made deliberately high to avoid the criticism that it might have been due to other factors than the loss of water. It should be noted that no allowance was made in our calculations for the gain in weight normallly expected late in pregnancy and that the loss of weight was therefore always greater than it seemed.

Age, Race, Parity and Stage of Gestation.—The age range of these 11 patients, 8 of whom were white and 3 Negro, was from 25 to 42 years, and the average was 34 years. All were multiparas, the parity ranging from three to eleven pregnancies. Observations on this and

2. Arnell, R. E., and Guerriero, W. F.: Nutritional Edema in Pregnancy, with an Analysis of 8 Severe Cases, Am. J. Obst. & Gynec. 43: 467-483 (March) 1942.

other groups of patients leave no doubt that the tendency to protein malnutrition is more likely to develop in older women and that it is increased by the strain of repeated pregnancies in rapid succession.

All 11 patients were in the last trimester of pregnancy when the edema was first observed, the duration ranging from twenty-nine to thirty-eight weeks and averaging thirty-four weeks. It is logical that nutritional disturbances should appear at this time, since both maternal and fetal requirements are highest in the final trimester of pregnancy.

TABLE 4.—*Serum Protein Values and Colloid Osmotic Pressures in 11 Pregnant Women with Massive Nutritional Edema*

Case	Serum Proteins *			Albumin-Globulin Ratio	Colloid Osmotic Pressure †
	Total	Albumin	Globulin		
1.....	3.0	1.6	1.4	1.14	9.3
2.....	3.2	1.6	1.6	1.0	9.9
3.....	3.4	1.9	1.5	1.26	11.1
4.....	3.6	1.8	1.8	1.0	11.6
5.....	3.8	2.1	1.7	1.23	12.9
6	4.0	1.8	2.2	0.82	12.8
7.....	4.1	2.0	2.1	0.95	13.7
8.....	4.4	1.9	2.5	0.76	14.5
9.....	4.5	2.2	2.3	0.96	15.6
10.....	4.8	2.5	2.3	1.08	17.5
11.....	5.4	2.2	3.2	0.70	18.6
Mean.....	4.01	1.96	2.05	0.99	13.40

* In grams per hundred cubic centimeters.
† Calculated in centimeters of water.

Clinical Data.—Edema was the only subjective or objective finding common to all cases. It had been present in mild degree for several weeks in all the patients, but the massive degree appeared suddenly. Although it involved the lower extremities and trunk and in some instances the upper extremities and face also, it was usually the edema about the vulva of which the patients chiefly complained. None of them, contrary to the experience of others who have studied hypoproteinemia, developed either ascites or pulmonary edema, though some consider the lungs to be the site of predilection in this type of edema.

TABLE 5.—*Serum Protein and Blood Values in Relation to Protein Dietary Intake in 11 Pregnant Women with Massive Nutritional Edema*

Case	Serum Proteins *		Blood			Protein Intake ‡	Associated Conditions
	Albumin	Total	Hemoglobin	Red Blood Cells †	Hematocrit		
1	1.6	3.0	7.0	2.80	24.0	0.38	Vomiting
2	1.6	3.2	8.8	3.25	33.0	0.24	
3	1.9	3.4	9.2	3.10	30.0	0.33	
4	1.8	3.6	5.5	1.50	18.0	0.80	Hookworm
5	2.1	3.8	4.8	1.30	14.0	0.75	Hookworm
6	1.8	4.0	10.0	3.60	35.5	0.38	Influenza
7	2.0	4.1	9.0	3.45	30.8	0.50	
8	1.9	4.4	8.8	3.13	....	0.40	Colitis
9	2.2	4.5	7.7	2.85	28.6	0.60	
10	2.5	4.8	6.8	2.48	....	0.55	Malaria
11	2.2	5.4	8.9	3.80	26.0	0.35	Diarrhea
Mean	1.96	4.0	7.9	2.84	26.6	0.48	

* In grams per hundred cubic centimeters; 14.7 Gm. per cent hemoglobin = 100%.
† In millions.
‡ In grams per kilogram of body weight daily.

Weakness and dyspnea, although frequently observed, were not present uniformly, their appearance seeming to depend on the degree of edema. In 2 instances the blood pressure was slightly elevated, to 150/90 and 148/85 respectively, and all the patients had rapid pulse rates when they were first seen. Both the hypertension and the elevation of the pulse rate promptly disappeared after several hours of rest in bed and could reasonably be attributed to the effects of dependency and physical activity as well as to the increased effort required to move the swollen extremities.

Laboratory Data.—All laboratory investigations except those which concerned certain elements of the blood were essentially negative. In 2 instances there was a transient heavy trace of albumin, but otherwise all urinalyses were negative. Hypoacidity was noted in 2 of the 6 cases in which gastric analyses were made. The Quick hippuric acid test, carried out in 4 cases, revealed no evidence of hepatic dysfunction. Roentgenologic examination of the chest and heart, and electrocardiographic examinations revealed no significant findings, and examinations of the eyegrounds were uniformly negative. The results of determinations of the urea nitrogen, nonprotein nitrogen, sugar, chlorides, cholesterol, pyruvates and carbon dioxide combining power of the blood were all within normal range for the stage of pregnancy.

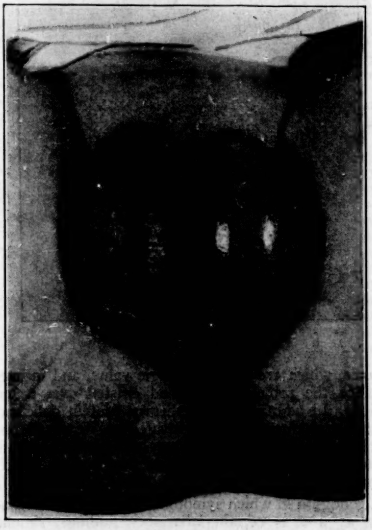

Fig. 2.—Massive edema of the vulva in a case of nutritional edema in pregnancy before treatment.

Anemia was present in 10 instances, being of the hyperchromic variety in 2 and of the hypochromic variety in the remainder. We have demonstrated by therapeutic test that the anemia per se was not responsible for the edema.

The serum protein concentration of the blood was low in all 11 cases (table 4), the principal decrease being in the albumin fraction. Calculations of the colloid osmotic pressure of the serum protein gave values in all cases well below the levels at which edema would be expected to appear, that is, whenever the colloid osmotic pressure of the serum proteins is less than 20 cm. of water. At this level the serum protein concentration is usually less than 5.5 Gm. per hundred cubic centimeters and the serum albumin concentration is usually less than 2.5 Gm. per hundred cubic centimeters.

Dietary Deficiencies.—Investigation of the diets of these 11 patients revealed pronounced deficiencies in

protein content (table 5). Not 1 had an optimum intake of protein, and only 1 had an intake above the minimum subsistence level for the last trimester of pregnancy. The highest daily intake was 0.9 Gm., the lowest 0.24, and the mean 0.48 Gm. per kilogram of body weight daily. Approximately a third of the total protein intake was derived from cereal and vegetable

Fig. 3.—Same case after treatment.

sources, which are of low biologic value, and in every instance the protein deficit had existed over a long period. In addition to the dietary protein deficiency, the hypoproteinemia was aggravated in 7 of the 11 cases (table 5) by conditions which resulted in either inadequate utilization or actual loss of the protein ingested.

Diagnosis.—Diagnostic difficulties are to be expected in a condition in which symptomatology and gross findings, as well as certain laboratory findings, simulate those of other diseases. The errors in diagnosis on admission of these patients, which have already been listed, are proof of the possible confusion.

It is perfectly possible, furthermore, for nutritional edema to coexist with other diseases and conditions, such as vomiting or diarrhea from any cause, hookworm disease, amebiasis, cardiac or cardiorenal disease, and even the various toxemias of pregnancy. Edema is a clinical manifestation of many of these states, but it may be aggravated or made intractable by an associated nutritional factor, which should always be considered as a possibility in pregnancy, particularly when there is an inadequate response or no response to the therapy of the special disease. In our experience swelling of the vulva, such as was apparent in these 11 cases, is unusual in obstetric patients unless it is associated with acute nephritis or the nephrotic syndrome, both of which can readily be excluded. This observation may be of diagnostic aid (figs. 2 and 3).

Therapy and Results.—All 11 patients were treated according to the following plan:

1. Complete bed rest was instituted at once, with, as already noted, general improvement within a few hours.

2. Intravenous infusions of dextrose solution were given for their nutritive value, their diuretic effect and their effect on the liver.

3. Vitamins B_1 and C were administered parenterally, on the empiric basis of possible deficiencies in these accessory dietary factors, although such deficiencies have not been demonstrated in nutritional edema.

4. Puncture of the swollen labia, under strict aseptic precautions, was carried out in several cases in which swelling about the vulva was a source of great discomfort.

5. A high protein diet was instituted for all patients who did not have digestive disturbances which contraindicated oral feeding.

6. Since such extreme deficiencies as were present in this group of cases cannot be corrected entirely, or even chiefly, by oral feeding, supplemental measures were instituted to repair the protein deficiency.

The most important of these supplemental measures was transfusion of whole blood or of plasma. Whole blood is more desirable when treatment is first instituted, because of the anemia frequently associated with hypoproteinemia. After the anemia is corrected, plasma is more desirable, partly because there is no purpose to overloading the circulation with unneeded red blood cells and partly because a given amount of plasma contains a much larger quantity of protein than does a similar amount of whole blood. Each of the 11 patients received an average of four transfusions given in large quantities, at fairly close intervals and totaling 2,000 cc.

Amino acids were used in 3 cases in this series, and the good results duplicated the results we have achieved with the same preparation in 12 other cases, not included in this series, chiefly instances of toxemia. We have had no experience with serum albumin transfusion.

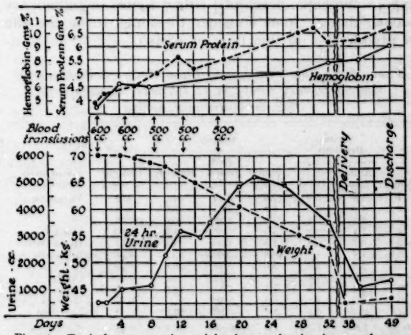

Fig. 4.—Typical response in weight loss, polyuria, increased serum protein concentration and hemoglobin value, following repeated whole blood transfusions in nutritional edema. The loss of weight represents a loss of edema fluid.

In our experience the serum protein of the blood is best raised:

1. By repeated blood transfusion.
2. By blood transfusion supplemented by amino acids.
3. By plasma transfusion supplemented by amino acids.
4. By plasma transfusion.
5. By amino acids.

Elevations of as much as 0.5 Gm. of plasma protein were observed following a single transfusion of 500 cc.

of whole blood, but the improvement was not maintained unless additional transfusions were given with reasonable promptness (fig. 4). The effectiveness of amino acids in increasing the plasma protein concentration of the blood is evidence that the mechanism of the synthesis of protein is not at fault, as these acids must be converted to plasma protein within the body. When blood or plasma is used, naturally no proof of the integrity of this mechanism exists, since these fluids furnish direct substitutes for the deficient elements.

The clinical improvement which followed even small elevations of the serum protein concentration in these cases is added proof that there is no critical level at which edema appears or disappears. Clinical observation suggests that when the vicious cycle which produces edema is interrupted by raising the plasma protein concentration and thus increasing the plasma colloid osmotic pressure, a polyuria is produced, which usually continues until the water balance is restored and edema has completely disappeared.

The average duration of treatment in these 11 cases was fifteen days, and the average loss of weight 9 Kg. (20 pounds), the range being from 7.4 to 19 Kg. The average serum protein concentration at delivery was 6.9 Gm. per hundred cubic centimeters as compared with 4.01 Gm. per hundred cubic centimeter on admission; the range was from 5.8 to 7.5 Gm. per hundred cubic centimeters. The average hemoglobin at delivery was 10.4 Gm. per hundred cubic centimeters as compared with 7.9 Gm. per hundred cubic centimeters on admission, and the average red blood cell count was 3,700,000 per cubic millimeter as compared with 2,840,000 per cubic millimeter on admission. Pitting edema had disappeared in all cases prior to delivery.

There were no maternal or fetal deaths, and the children did not present abnormalities of any sort. The fetal values for serum protein and other blood elements were within normal range, and the average weight at birth was 3,674 Gm. (8 1/10 pounds), which seems, incidentally, to dispose of the idea that a low protein intake results in small babies.

Follow-Up.—The edema which brought these 11 patients to the hospital has not reappeared in the periods from six months to five years during which they have been followed up. Two of the group have been observed in subsequent pregnancies, both of which were normal in all respects.

SUMMARY

1. Although demonstrable degrees of protein deficiency are not common, subclinical deficiency is frequent.

2. A study of the incidence of this deficiency, based on the dietary intake of 400 unselected pregnant women, showed that 18 per cent had a protein intake less than half of the optimum recommended for the latter half of pregnancy and that almost 80 per cent consumed diets which were classified as fair or less than fair.

3. A study of the possible relationship of deficiencies in protein intake to certain laboratory and clinical data resulted in much less exact conclusions than a study of the incidence of protein deficiencies. In general, a significant relationship was found to exist between the protein content of the diet and the serum protein concentration and hemoglobin content of the blood, the average values being lowest in the deficiency group. These studies suggest that protein deficiencies may be of etiologic significance in eclampsia and preeclampsia and may increase the maternal morbidity and the fetal mortality. The birth weight is apparently not affected.

4. In 11 cases of massive nutritional edema in pregnancy complete recovery ensued on a regimen the basic principle of which was reparation of the protein deficiency.

ABSTRACT OF DISCUSSION

DR. PHILIP F. WILLIAMS, Philadelphia: Some years ago I made a survey of the food intakes of 514 pregnant women in the antepartum clinics of different hospitals and from private practice in Philadelphia. The large proportion of the women were ingesting lower than the commonly accepted standards of the National Research Council on the amount of protein which a pregnant woman should take per day, namely 85 Gm. We worked out the percentage distribution of protein intake by gram of protein per kilogram of body weight, which is presumably the proper way to figure out the protein intake for a person, and in the group in which 86 per cent of the patients received less than 85 Gm. of protein per day we found that 92 per cent of the series received less than the estimated requirement of 1.5 Gm. of protein per kilogram. No woman in the group received anything like the figure Dr. White suggested for a diabetic woman, namely 2 Gm. We found that almost 50 per cent of the women were eating less than 1 Gm. of protein per kilogram of body weight. At the time I made this survey of the food intakes we watched the women carefully for evidences of toxemia, labeling such cases as toxemic if they had any degree of albuminuria, hypertension or edema. Consequently I was interested in Dr. Arnell's and Dr. Goldman's presentation sometime ago in their original paper on this subject of the universal pitting edema that the women in their series had on this low protein intake. I found no such case of that nature in this series. There were 60 cases of toxemia of late pregnancy, but I was unable to make any positive correlation at all between the intake of protein and the incidence or the degree of severity of the toxemias, because the majority of women in the toxemic group were receiving on an average just the same protein intake as the women in the control or normal group were receiving. There is no time in the life of a person when we can get more good educational work over than in the period of a woman's pregnancy, and it is important then because not only does it influence her pregnancy and health and that of her unborn child but the educational features remain with her for the benefit of her family and others all her life.

DR. WILFRED N. SISK, Asheville, N. C.: Some people, particularly those in the lower economic groups, have a peculiar idea as to what constitutes a satisfactory diet. Their diet is extremely poor in protein and extremely high in salt; their diet is also poor in vitamins. I think that the poor vitamins and protein in their diet are made worse by the commercial preparation of foods. In public health departments such as I run we are interested in diet not only during pregnancy but during all times of life, but, as Dr. Williams just stated, pregnancy is a time when there is a considerable strain on the body of the patient, and this is the best time to give instruction in diet. There is one practical point in the instruction of the patient which I feel many of us overlook. It is important to consider what the patient can or will buy and consume. Many of my colleagues in Asheville have a tendency to give a patient instructions and sometimes don't know enough about his home life to realize that he is not likely to follow them. Particularly is this true of the Negro patients. They will listen and give you "Yassah, yassah, Ah'll be glad to do that" and then go home and do absolutely nothing that you have told them.

DR. RUPERT E. ARNELL, New Orleans: Adequate antepartum care should include a careful dietary survey early in pregnancy, with particular attention to protein, minerals and vitamins and prompt correction of any defect or deficiency which might exist. At the Charity Hospital in New Orleans the efforts of the dietary department in giving diet instruction by means of mothers' classes and individual consultations to some 5,000 pregnant women each year have proved of inestimable value. By bearing a few basic facts in mind any competent physician can give effective instruction and advice on diet and nutrition. The physician, the dietitian, the scientist must accept the responsibility for disseminating the gospel of good nutrition; it must not be relinquished to the politician or the business concern.

THE CLINICAL USE OF PENICILLIN

IN THE TREATMENT OF INTRINSIC BRONCHIAL ASTHMA

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MEDICAL CORPS, ARMY OF THE UNITED STATES

CAPTAIN MERVIN B. WINE
MEDICAL CORPS, ARMY OF THE UNITED STATES

CAPTAIN WENDELL ALLEN
SANITARY CORPS, ARMY OF THE UNITED STATES

CAPTAIN CHASE S. THOMPSON
MEDICAL CORPS, ARMY OF THE UNITED STATES
AND
LIEUTENANT COLONEL MERRITT P. STARR
MEDICAL CORPS, ARMY OF THE UNITED STATES

Since penicillin was originally advocated as a chemotherapeutic agent by Chain and his associates,[1] reports have appeared in the literature on its efficacy in certain infectious diseases. Its clinical use has been reviewed by Lyons,[2] and more recently by Dawson and Hobby,[3] Herrell [4] and Bloomfield, Rantz and Kirby,[5] although no report has previously been made on its use in the treatment of bronchial asthma.

All 9 patients were tested intracutaneously with extracts of common pollens, inhalants and foods. Eight of the 9 reacted positively with wheal and pseudopod formation to tests with extracts of pollen, house dust or air borne molds. One patient was entirely negative by skin tests. There was no evidence of food sensitivity in any case. Elimination and injection therapy with skin reacting inhalant allergens had prevoiusly failed to alter the asthmatic state of any of the patients.

It was assumed that the etiology in these cases was probably a primary bronchial infection (bacterial allergy) and for that reason treatment with penicillin was instituted.

THERAPY

Five patients received continuous therapy of a total of 500,000, 1 patient 800,000 and 1 patient 1,300,000 Oxford units intramuscularly. Eighty thousand to 100,000 units was administered each twenty-four hour period at four hour intervals.

At a later date the 7 patients having previously received intramuscular penicillin and 2 additional patients (duration of asthma being three months) were treated with penicillin intratracheally by means of a pressure spray and a curved cannula extending to the base of the protruded tongue. Eight of these patients received a total of 500,000 units, 1 receiving only 180,000 units because of the precipitation of asthma at the time of each administration of penicillin.

Treatment of Nine Cases of Intrinsic Bronchial Asthma with Penicillin

Patient	Age, Years	Duration of Asthma	Total Dosage of Penicillin in Oxford Units		Results of Vital Capacity Studies: Vital Capacity Before Penicillin			Vital Capacity After Penicillin		
					Average Vital Capacity					
			Intramuscularly	Intratracheally	No. of Tests	Before Epinephrine, Cc.	After Epinephrine, Cc.	No. of Tests	Before Epinephrine, Cc.	After Epinephrine, Cc.
1. S. R. C.	23	All life	500,000	500,000	2	3,625	3,913	2	3,713	3,938
2. W. L. W.	23	3 mo.	500,000	500,000	3	3,208	3,975	2	4,370	4,650
3. G. D. N.	22	8 yr.	500,000	500,000	3	3,765	4,150	1	3,400	3,975
4. C. J. F.	21	7 yr.	800,000	500,000	2	3,175	3,778	4	3,906	4,353
5. A. J. F.	21	14 mo.	500,000	180,000	3	3,083	3,988	3	4,633	4,558
6. L. L. H.	25	All life	500,000	500,000	2	4,018	4,200	4	3,506	4,127
7. B. L. M.	26	All life	500,000	500,000	2	2,950	3,925	3	3,033	4,550
8. R. P. M.	19	All life	1,300,000	500,000	2	2,875	3,202	5	3,450	3,875
9. S. W. G.	43	2 mo.	500,000	500,000	3	3,585	4,067	4	3,481	3,981

The high incidence of intrinsic bronchial asthma, occurring in the young age group at this A. A. F. Regional Hospital,[6] led to a search for newer methods of treatment.

Nine patients with intrinsic bronchial asthma were treated with penicillin. All cases were observed a minimum of four weeks before and four weeks after treatment. All cases were considered to be of moderate or severe degree in that they required emergency therapeutic measures daily (epinephrine subcutaneously or aminophylline intravenously). Seven of the patients were "lifelong asthmatics," whereas 2 were cases of short duration, approximately three months. All cases showed physical signs (sibilant and sonorous sounds on auscultation) constantly day and night. Eight of the patients were between 19 and 26 years of age; one patient was 43.

BACTERIOLOGY

Bacteriologic studies of sputums and of throat and nasal secretions were carried out in all 9 cases. There was no noticeable difference in the cultural growths from any of the three sources of material. Two to 6 sputum specimens from each patient were cultured before and after treatment. The patients exhibited a predominance of four types of organisms: non group A beta hemolytic streptococcus, alpha streptococcus, gamma streptococcus and pneumococcus. There was no attempt made to group the beta hemolytic streptococci other than to classify them with group A serum, the serum for the other eight groups not being available. The method used in attempting to group them was the capillary precipitation technic as described by Swift, Wilson and Lancefield.[7] Pneumococcus was established by the bile solubility test.

Four of the 9 patients presented non group A beta hemolytic streptococcus before administration of penicillin. Only 1 presented this organism after administration. All 9 presented alpha streptococcus before

From the A. A. F. Regional Hospital, San Antonio Aviation Cadet Center, San Antonio, Texas, Col. C. S. Williamson, commanding.

1. Chain, E.; Florey, H. W.; Gardner, A. C.; Heathy, N. G.; Jennings, M. A.; Orr-Ewing, J., and Sanders, A. G.: Penicillin as a Chemotherapeutic Agent, Lancet **2**: 226 (Aug. 24) 1940.

2. Lyons, Champ: Penicillin Therapy of Surgical Infections in the U. S. Army, J. A. M. A. **123**: 1007 (Dec. 18) 1943.

3. Dawson, M. H., and Hobby, Gladys L.: The Clinical Use of Penicillin: Observations in 100 Cases, J. A. M. A. **124**: 611 (March 4) 1944.

4. Herrell, W. E.: The Clinical Use of Penicillin, an Antibacterial Agent of Biologic Origin, J. A. M. A. **124**: 622 (March 4) 1944.

5. Bloomfield, A. L.; Rantz, L. A., and Kirby, W. M. M.: The Clinical Use of Penicillin, J. A. M. A. **124**: 627 (March 4) 1944.

6. Hampton, S. F., and Rand, Harold: The Problem of Allergy at an A. A. F. Regional Hospital: I. Respiratory Allergy (Hay Fever, Vasomotor Rhinitis, and Bronchial Asthma), J. Allergy **15**: 355 (Sept.) 1944.

7. Swift, H. F.; Wilson, A. T., and Lancefield, R. G.: Typing Group A Hemolytic Streptococci by M Precipitin Reactions in Capillary Pipets.

treatment and 8 of them presented the same picture after treatment. Six presented gamma streptococcus before treatment and 5 after treatment. Pneumococcus was found in 8 patients prior to their treatment and could be identified in 4 after treatment.

The normal incidence of beta hemolytic streptococcus at the time this study was started was somewhat higher than at the conclusion. This may account for the decreased incidence of beta hemolytic streptococcus in subsequent cultures.

VITAL CAPACITY STUDIES

Spirographic tracings and vital capacity determinations were performed on each patient by means of a spirometer and kymograph before and after penicillin therapy. Recordings were made before and thirty minutes after epinephrine was administered subcutaneously. An increase of 500 cc. or more in the average vital capacity was noted in 4 of the 9 cases. There were no specific observations to be made in the vital capacity studies before and after epinephrine except that the vital capacity after epinephrine was greater in 5 of the 9 cases following penicillin therapy, as shown in the table.

BRONCHOSCOPIC STUDIES

Bronchoscopies were performed on 6 of the 9 patients and all 6 showed signs of bronchitis, subacute or chronic, as manifested by a reddened bronchial mucosa and a significant amount of mucopus that contained numerous polymorphonuclear leukocytes as well as eosinophils. Bronchoscopies were repeated on 2 of the 6 patients approximately two weeks after penicillin intramuscularly and intratracheally and the findings were essentially unchanged.

PENICILLIN ALLERGY

All patients were given cutaneous tests with the freshly dissolved penicillin before and after treatment. Whereas the concentrated solution was slightly irritating to the skin of some patients, all reacted negatively with 1 : 100 and 1 : 10 dilutions. One patient in whom an exacerbation of asthma occurred during the course of intramuscular penicillin had a transitory positive skin reaction in a 1 : 100 dilution after treatment. This patient reacted positively to test with an extract of Penicillium mold as well. A specific skin sensitivity to penicillin could not be demonstrated by passive transfer tests (Prausnitz-Küstner reaction [8]).

CONCLUSIONS

There was slight clinical improvement in 4 of the 9 cases of intrinsic bronchial asthma treated with penicillin, as evidenced by the occurrence of fewer and less intense symptoms and physical signs requiring emergency measures and by the vital capacity studies. It was our opinion, however, that penicillin administered intramuscularly or intratracheally in the dosages used in this study was of little or no value and that penicillin offers no advantage over other types of therapy in the treatment of intrinsic bronchial asthma.

8. Prausnitz, C., and Küstner, H.: Studien über die Ueberempfindlichkeit, Centralbl. f. Bakt. **86**: 160, 1921.

Fiji Island Hospital Facilities.—All the hospitals in Fiji are owned or controlled by the government. In 1938 there were four well equipped general hospitals, sixteen provincial hospitals and a chain of thirty-one dispensaries throughout the islands. The medical services in Fiji are almost exclusively rendered by government physicians. Valuable medical service is rendered to the native population by the native Fiji medical practitioners.—Simmons, James S.: Global Epidemiology, Philadelphia, J. P. Lippincott Company, 1944.

THE MECHANISM AND MANAGEMENT OF SURGICAL SHOCK

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CHICAGO

Surgical shock is the term commonly used to denote the acute embarrassment or failure of the circulation which arises as a result of bodily injury, whether produced intentionally, in combat and in surgical operations, or unintentionally in accidents of civil life.

There has been a great deal of debate about the mechanism of production of shock and about the relative role of various factors which may help in bringing it about, but in recent years it has been established primarily by the surgeons that the overwhelmingly important cause of surgical shock in man in good general condition prior to injury or operation is local loss of whole blood or plasma, or a combination of the two, from the circulation, thereby reducing the circulatory blood volume. If this reduction is sufficiently pronounced and prolonged, the blood pressure drops to a low level, anoxia develops, the tissues are damaged, there is generalized impairment of body function, and a continuation of such a state results in complete failure of the circulation and death.

The loss of whole blood is by far of the greatest importance, since it is the main cause of shock in operations and in most injuries which open blood vessels. The loss may be to the outside, into the body cavities or into the tissues. Plasma may be lost both to the outside and into the tissues in burns, into the tissues only after prolonged use of tourniquet and into the peritoneal cavity, as in case of strangulation of a loop of intestine by an adhesive band or of mesenteric thrombosis. Blood and plasma in varied proportions may be lost into traumatized tissue, as in limbs hammered for the production of experimental shock or limbs crushed and compressed by falling objects in air raid casualties or in accidents of civil life.

It is still a very common error in both operations and injuries to overlook the local fluid loss or to underestimate the amount of it and to neglect transfusion while groping about in the dark in search of another cause for shock. It should be remembered in blood examinations made for the detection of shock that the loss of whole blood most frequently causes blood dilution, although concentration is common, especially in the later stages. Plasma loss causes blood concentration. Loss of a mixture of blood and plasma may cause little or no change in red count, hemoglobin or hematocrit findings.

Proof that the big cause of shock is local loss of fluid is furnished by the outstanding success obtained by its treatment with transfusions. What is said here deals more specifically with civil practice than with military practice, but the rules for the two are pretty much the same. Wherever possible the treatment should be by transfusion of whatever substance has been lost from the circulation and in approximately the amount that has been lost. When blood has been lost give blood, when plasma has been lost give plasma, and when both have been lost give blood and plasma.

In emergencies when plasma is available give it while provisions are being made for giving blood. If neither blood nor plasma is available, use the next

Read in a panel discussion on "Plasma and Blood Substitutes" in the General Scientific Meetings at the Ninety-Fourth Annual Session of the American Medical Association, Chicago, June 13, 1944.

best available solution such as gelatin, saline solution or glucose.

As a rule, no operation should be done in injury cases or in internal hemorrhage from disease, as bleeding ulcers or ruptured tubal pregnancy, until the shock has responded, at least to a considerable extent, to transfusion treatment. In nonemergent surgical operations it is possible today to use blood and to a lesser extent plasma along with good hemostasis and good operative technic in such a way that shock is almost eliminated from the list of complications. For this purpose a blood bank is an extremely desirable requirement, although it is not an absolute one.

Preoperatively the correction of anemia and hypoproteinemia by transfusion will reduce the tendency to shock. During operation blood should be given as blood is lost and in amounts equal to the blood loss, whether it be 500 cc. or 5,000 cc. Hence a close track should be kept of the amount of blood lost, and the weighing of the used blood-soaked sponges at intervals during the operation may be helpful for this purpose. With adequate transfusion before, during and after operation and with modern anesthesia, operations of great magnitude, such as pneumonectomy, partial pancreatectomy and duodenectomy for cancer of the head of the pancreas, complicated and multiple abdominal reactions, transthoracic resection of esophagus and stomach and massive resection and transplantation of bone are now being done successfully which were impossible before, and persons severely injured and burned are being saved who almost invariably died before. Adams and his associates [1] have shown that the danger of poisoning from massive transfusion of citrated blood is extremely slight with the usual method of administration clinically, since the citrate concentration almost never reaches toxic levels.

Plasma finds its main fields of usefulness as a substitute for blood in cases of shock due to hemorrhage when blood is not available and in the treatment of burns. It seems only reasonable to give blood instead of plasma when blood is being lost, as during an operation.

The theory that toxins form in the crushed tissues which cause shock arose during the first world war mainly because the investigators of that day either missed or underestimated the importance of the fact that both clinically and experimentally there is a local loss of blood externally or of blood and plasma at the seat of trauma which is usually sufficient to account for the picture; also that plasma in amounts sufficient to cause shock is lost into a limb after release of a tourniquet that has been on too long, as first demonstrated experimentally by Wilson and Roome.[2]

Since the observation of these facts the toxic theory has enjoyed less favor, but the crush syndrome observed in this war has presented evidence that a toxic factor may play some role in shock production, although some investigators, both English and American, stress the fact that the fall in blood pressure following release of the crushed extremity is due principally to the loss of plasma and blood into the field. A very serious objection to the toxic theory is that, since blood and plasma have been used in such very large amounts, enormously traumatizing operations have been performed which according to the theory should create toxins, but the patients have tolerated them without developing shock.

There has always been a tendency to regard shock as a nervous reaction or as brought about somehow through the nervous system. This is due in part to the fact that a purely psychic reaction, as one resulting from the sight of blood or from pain, may cause the passage of depressor impulses from the brain to the cardiac and vasomotor centers in the medulla and lower the blood pressure so much that fainting occurs. But the fainting or syncope reaction is short lived and never lasts long enough to cause shock per se. Unless there is an associated blood loss which also lowers the blood pressure, the reaction wears off in the course of a few minutes to a half hour, without consequence, and the effect is rather to alarm the friends or the doctor than to harm the patient. No one with an otherwise intact circulation ever dies or is seriously affected from syncope.

The view has been prevalent that so-called nociceptive nerve impulses may come from the damaged field and cause shock by acting on the cerebrum and vasomotor centers in the medulla in such fashion as to induce circulatory embarrassment or failure. Those who have supported the theory of nociceptive impulses have variously explained the method of action. Cannon advanced the theory that they cause overactivity of the sympathoadrenal system and vasoconstriction, but it has failed to find any support clinically. Freeman,[3] who reported experimental evidence in favor of the theory, has recently disavowed it clinically, and Schafer [4] has been unable to substantiate it either clinically or experimentally.

Swingle and his associates [5] in a recent article claimed that in limb trauma experiments on dogs nociceptive impulses produce shock because it could be prevented by prolonged spinal anesthesia, thereby blocking the impulses. No statement was made as to whether the impulses have a pressor or a depressor effect on the vasomotor system. But they did not estimate the amount of fluid lost into the hammered limbs, and they hammered the limbs after giving spinal anesthesia, at a time when it had lowered the blood pressure to an average of 75 mm. of mercury, which in itself materially reduces the amount of blood lost into the limb. If a limb is hammered with the blood pressure at 150 mm. of mercury and vessels are torn, there should be more blood lost into the tissues than if the blood pressure is 60 or 75 mm. of mercury from spinal anesthesia at the time of the hammering, as shown by comparing its weight with that of the opposite limb; also closure of bleeding points occurs more rapidly while the pressure is low, which lessens the amount of hemorrhage from the damaged vessels after the spinal anesthetic wears off and the blood pressure rises.

Two months later the same authors [6] reported that section of the spinal cord at the level of the last thoracic vertebra, or of all the nerves to the hammered limbs, did not eliminate shock, which by the same token should also eliminate the nociceptive theory from consideration in shock due to extremity wound.

Laestar and I recently made comparative limb volume studies after traumatization under ether anesthesia of the right hind limb (1) of normal dogs, (2) of dogs

1. Allen, J. G.; Clark, D. E.; Thornton, T. F., Jr., and Adams, W. E.: Surgery **15**: 824 (May) 1944; Ann. Surg., to be published.
2. Wilson, H., and Roome, N. W.: Effects of Constriction and Release of Extremity: Experimental Study of Tourniquet, Arch. Surg. **32**: 334 (Feb.) 1936.
3. Freeman, N. E.; Freedman, H., and Miller, C. C.: Am. J. Physiol. **131**: 545 (Jan.) 1941.
4. Schafer, P. W.: Surg., Gynec. & Obst. **79**: 163 (Aug.) 1944.
5. Eversole, W. J., and others: Am. J. Physiol. **140**: 490 (Jan.) 1944.
6. Swingle, W. W., and others: Am. J. Physiol. **141**: 54 (March) 1944.

under spinal anesthesia which lowered the blood pressure to 50-80 mm. of mercury and (3) of dogs whose right iliac and profunda arteries were first ligated, lowering the blood pressure of the limb to shock levels but leaving its nervous pathways intact.

In group 1 twenty hammer blows per kilogram of body weight produced shock and death in an average

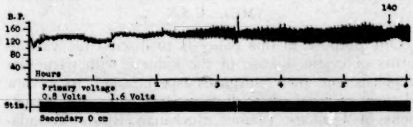

Fig. 1.—Strong stimulation of sciatic nerve of anesthetized dog for six hours without production of fall in blood pressure and shock.

of three hours, and the blood and plasma loss into the traumatized side was equal to 47 per cent of the estimated blood volume. In group 2 twenty-two to twenty-five similar blows per kilogram of body weight failed to produce shock, and the animals that were not killed until the following day had recovered except for the traumatized limb. Animals which were kept under spinal anesthesia from one to four hours after the hammering and then killed within the next one and one-half hours showed a local loss of fluid in the limb equal to about one half of that found in group 1.

In group 3 twenty-five similar blows per kilogram of body weight also failed to produce shock, and the animals which were not killed until the following day had recovered likewise. Others which were killed one to two hours after the hammering showed local fluid loss into the limb of less than 50 per cent of the estimated blood volume.

From these experiments it may be concluded that the animals in group 2 were protected from shock by the spinal anesthetic, not by virtue of blockage of nerve impulses but by the low blood pressure, which greatly reduced the amount of hemorrhage in the limb. The animals in group 3 were similarly protected by the arterial ligation, as further witnessed by the fact that the nervous pathways were not blocked.

If the nociceptive theory were of great importance, it would be expected that intense continuous stimulation of the central end of the divided sciatic nerve of an animal with a tetanizing current, thereby sending in vastly more impulses than would come from a wound except perhaps at the time of its production or of very rough handling, might cause shock. However, such nerve stimulation has been carried out for as long as six or seven hours on the anesthetized dog without the production of any fall in blood pressure or other evidence of shock.

Figure 1 shows the kymographic tracing of the blood pressure of a 10.8 Kg. dog for six hours, anesthetized with 2.7 Gm. of sodium barbital intravenously. The left sciatic nerve was divided, and an electrode connected with a Harvard inductorium was applied to the proximal end. The blood pressure registered 124 mm. of mercury when stimulation of the nerve was begun (*a*) with 0.8 volt of alternating current in the primary coil and the secondary coil at 0 cm. This produced a slight rise of pressure, which at the end of seventy-two minutes had returned to the previous level. The stimulus was then changed by increasing the voltage in the primary to 1.6 volts. (*b*) The pressure rose promptly to 140 mm. of mercury and remained at approximately that level while the stimulus was continued for the next 4.8 hours, except for a two minute release at three and one-third hours. The respirations were deep and slow, being 3 per minute at three and one-third hours and 7 in three minutes at five and two-thirds hours, and the pulse rate remained in the vicinity of 70 per minute. The argument that in case of a wound a large percentage of the impulses passing from affector organs would act more powerfully than those passing from the point of stimulation of a nerve trunk does not seem valid, since the foregoing type of sciatic nerve stimulation is so extreme that if, while it is being carried out under ether, the degree of anesthesia were not maintained at an advanced level, the animal would soon begin to display evidence of extreme pain.

My associates and I [7] have produced prolonged and severe lowering of the blood pressure by a more purely neurogenic mechanism than has been reported before, through stimulation of the aortic depressor and carotid sinus nerves. While it has been possible to lower the blood pressure decidedly from vasodilatation and bradycardia and produce anoxia, tissue damage and shock in this way, it usually requires several hours to do so. Also removal of the stimulus before shock is well established is followed by prompt return of the blood pressure to the vicinity of the previous level, and disappearance of alterations of the blood that may have been brought about.

This is illustrated by figure 2, which shows the blood pressure tracing of a rabbit during periods of stimulation of both aortic depressor nerves, which act by inhibiting principally the vasoconstrictor center and to a lesser extent the cardiac center in the medulla, causing a fall in blood pressure. Stimulation was kept up continuously for seven hours except for five rest periods of three to nine minutes each, totaling thirty-one minutes. The pressure ranged between 30 and 50, averaging 40 mm. of mercury for the period, and returned to

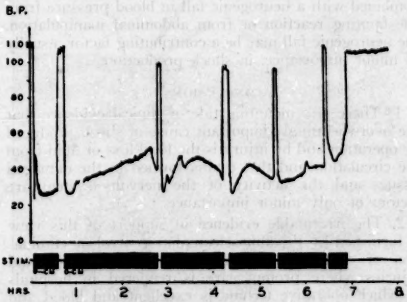

Fig. 2.—Rabbit weighing 4 Kg. Urethane anesthesia 2 Gm. intraperitoneally. Pronounced vasodepression during periods of stimulation of both aortic depressor nerves with very little impairment of the circulation, as shown by prompt recovery with each release.

the vicinity of normal with each release. Nothing approaching this prompt fall and rise of pressure and sustained vasodepression has been reported from direct stimulation of either somatic or sympathetic nerves in experimental animals. A patient with a blood pressure at this low level during similar periods due to injury or operation would occasion the greatest anxiety,

7. Phemister, D. B.; Laestar, C. H.; Eichelberger, L., and Schachter, R. J.: Ann. Surg. 119: 26 (Jan.) 1944.

and experience has shown that were it due to blood loss the anxiety would be justified. But the return to the original pressure after the final release was evidence of the relatively slight damage that had been produced.

The experiment suggests that if such a period of vasodepression in man is ever produced by a purely nervous mechanism (which has never been accurately recorded) it could probably be faced with equanimity. This makes it very improbable that primary shock is ever the result solely of the much more temporary reflex lowering of blood pressure caused by psychic activity or sometimes by intra-abdominal manipulations. When there has been no blood loss and when the arterioles and capillaries are dilated with blood accessible to the tissues as in reflex vasodilatation, the blood pressure may be reduced to a low level for a remarkably long time before there is sufficient anoxia and tissue damage for the creation of shock. This is in decided contrast with the situation in which there has been lowering of blood pressure from hemorrhage which causes constriction of the arteries and anoxia with early onset of shock.

In cases of abdominal manipulations the recent clinical experience with very extensive intra-abdominal resections and excisions has definitely established the fact that the massive blood and plasma transfusions which are necessary to replace the circulating fluid lost during operation effectively prevent the development of shock even though the conditions for reflex stimulation are maximum. Brunschwig [8] has reported the largest series of complicated massive resections of this type for carcinomas of the stomach, colon and pancreas without shock, and the general surgical experience with total gastrectomy for cancer has been similar.

However, experimentally, when severe blood loss has preceded or accompanies a reflex vasodilatation and lowering of the blood pressure from aortic depressor nerve stimulation, and clinically, when hemorrhage is combined with a neurogenic fall in blood pressure from the fainting reaction or from abdominal manipulation, the neurogenic fall may be a contributing factor, usually of minor importance, in shock production.

CONCLUSIONS

1. There is a mounting tide of clinical evidence that the overwhelmingly important cause of shock produced by operation and by injury is the local loss of fluid from the circulation and that toxins formed in the damaged tissues and the activity of the nervous system are factors of only minor importance.

2. The irrefutable evidence in support of this view is furnished by the almost complete control or elimination of shock as a complication of operations and injuries where prompt care is rendered in hospitals in which operative technic is excellent and blood and plasma transfusions are given in amounts equivalent to and either simultaneously with or soon after the blood and plasma loss.

3. A full appreciation of these facts will lessen the fear of nervous and toxic factors and lead to a great increase in the frequency of transfusions given in amounts equivalent to the blood and plasma lost, with corresponding improvement in the results of surgical therapy.

950 East Fifty-Ninth Street.

8. Brunschwig, A.: S. Clin. North America **24**: 185 (Feb.) 1944; Surgery of Carcinoma of the Body of the Pancreas, Ann. Surg., to be published.

THE SURGICAL ASPECTS OF CYSTIC DISEASE OF THE KIDNEY

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Our purpose in this paper is to discuss the various forms of cystic disease of the kidney, with particular emphasis on their surgical aspects, and to review 74 cases of renal cystic disease admitted to the Department of Urology (James Buchanan Brady Foundation) of the New York Hospital during the period January 1924 to April 1944. Of these, 19 were cases of simple renal cysts, 53 polycystic disease and 2 echinococcus cysts.

SIMPLE RENAL CYSTS

Etiology.—The exact cause of these lesions is unknown, but the bulk of evidence points to their being acquired and not congenital. The etiologic theories are numerous. Albarran thought they were a form of localized polycystic disease. Another and widely held belief is that they form as a result of the failure of the uriniferous tubules to unite with the collecting ducts. Hepler [1] believes that they are the result of localized tubular blockage and concomitant renal ischemia.

Pathology.—Simple cysts of the kidney are usually unilateral and single. Not infrequently, however, several do occur simultaneously in the same kidney; these are probably the so-called cases of "unilateral polycystic disease." For this reason we feel that the term "solitary" renal cyst is a misnomer and should not be used in describing these cysts.

Grossly, simple renal cysts present the appearance of tense, translucent, thin walled sacs somewhat resembling simple cysts of the ovary. They may occur at either pole of the kidney or in its midportion, as well as on the anterior, posterior, lateral or medial surface. Infrequently the cyst wall will be calcified. While monolocular cavities are the rule, multilocular cavities do occur. The cysts are generally filled with a clear, straw colored fluid not unlike urine; this contains water, albumin, chlorides, phosphates, sulfates, serum globulin, fats, cholesterin crystals and urea in minute quantities. Occasionally the contents are hemorrhagic, and rarely a cyst will contain purulent material.

Of great importance is the fact that about 25 per cent of the cysts containing hemorrhagic material have been proved malignant. Malignancy is rare, however, in the serous cysts or those containing clear fluid.

Involvement of the renal parenchyma by the cyst is usually minimal. The cysts tend to grow out from, rather than into, the kidney substance.

The expenses of this research were defrayed by the Alfred Busiel Research Fund.
From the Department of Urology (James Buchanan Brady Foundation) of the New York Hospital.
Read before the Section on Urology at the Ninety-Fourth Annual Session of the American Medical Association, Chicago, June 15, 1944.
Owing to lack of space, this paper has been abbreviated. The complete paper is available in the authors' reprints, a copy of which they will be pleased to supply on request.
This article has been released for publication by the Division of Publications of the Bureau of Medicine and Surgery of the U. S. Navy. The opinions and views set forth in this article are those of the writers and are not to be considered as reflecting the policies of the Navy Department.

1. Hepler, A. B.: Solitary Cysts of the Kidney, Surg., Gynec. & Obst. **50**: 668, 1930.

Symptomatology.—Small cysts are quite often symptomless and are discovered only at operation or autopsy. Again, a renal cyst may cause pressure on intra-abdominal organs and produce severe gastrointestinal symptoms simulating those caused by peptic ulcer, cholecystitis or partial intestinal obstruction. A large cyst at the upper pole of a kidney may cause pressure

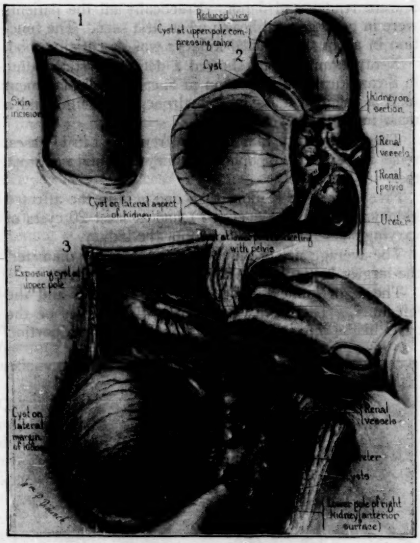


Fig. 1.—Removal of simple cysts of kidney, using fat and ribbon gut for repair of defects. A woman aged 58 had pain in the right upper quadrant radiating to the scapula for six months. A nontender, firm mass was palpated in the right kidney area. The preoperative diagnosis was neoplasm of the right kidney. At operation there was found a large cyst at the upper pole, a still larger one on the lateral margin, a small cyst between the two, and numerous smaller cysts scattered over the kidney surface, as shown above in 2 and 3. In 3 the cyst at the upper pole is being exposed by blunt dissection. (See also figs. 2, 3 and 4.)

on the diaphragm, thus producing dyspnea, cough and pain referred to the shoulders. In cysts of large size, pain in the kidney region of the affected side is common and is due to pressure from the cyst.

Urinary tract symptoms are present in a majority of the cases.

Diagnosis.—Depending on the size and position of the cyst, a mass may or may not be palpable in the renal region of the affected side. Cysts of the upper pole and posterior surface are generally not palpable. When palpable, the cyst is felt as a smooth, round, tense, generally nontender mass in the kidney area.

In the x-ray diagnosis, retrograde pyelograms and pyeloureterograms, as well as intravenous urograms, are of great importance. The following points require emphasis: 1. The x-rays may be entirely negative. 2. They may show changes in the renal outline. Intravenous urograms may be of help in delineating the kidney from the cyst shadow, particularly in cysts of the upper pole. An important point is that in neoplasms of the kidney the renal outline is often enlarged, whereas in simple cysts it is of normal size and can be differentiated from the cyst outline. 3. There may be deformity of the renal pelvis and calices. This usually consists of flattening, blunting or obliteration of a calix or flattening of the pelvis, the extent of the deformity depending on the position and size of the cyst. 4. There may be deformity and compression of the ureter. This is most common with cysts occurring at the lower pole. The ureter may be displaced or its compression may cause hydronephrosis, sometimes of considerable degree. 5. There may be x-ray evidence of changes in the axis and position of the kidney due to displacement by the cyst (ptosis, rotation, deviation of the long axis). 6. Calcification of the cyst wall may be evident. 7. There may be x-ray changes in other organs. A cyst may be so large, or so located, as to cause filling defects in a hollow organ such as the stomach and the intestine.

Treatment.—With cysts of small or moderate size, discovered during routine examination or investigation for unrelated disease and causing no deformity or interference with renal drainage, a policy of watchful waiting may be pursued. Frequent x-ray studies of the kidney should be made and, if progression occurs, immediate surgical exploration should be done. With moderate or larger sized cysts, however, we feel that surgical

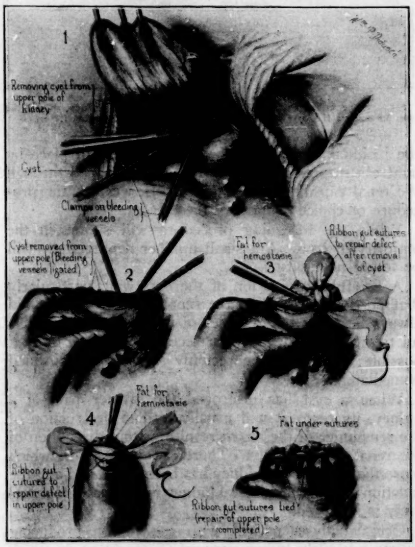

1
Removing cyst from upper pole of kidney
Cyst
Clamps on bleeding vessels
Cyst removed from upper pole (Bleeding vessels ligated)
2
Fat for hemostasis
3
Ribbon gut sutures to repair defect after removal of cyst
Fat for hemostasis
4
Ribbon gut sutured to repair defect in upper pole
5
Fat under sutures
Ribbon gut sutures tied (repair of upper pole completed)

Fig. 2.—1, removing cyst from upper pole in toto. 2, result after removal of cyst from upper pole; bleeding points are clamped. 3, ribbon gut sutures are used to close the defect at the upper pole; fat is used for hemostasis. 4, method of placing ribbon gut sutures. 5, repair completed.

exploration and treatment should be employed when at all feasible.

We have found that surgical removal of only the free portion of the cyst will give gratifying results in most cases. Removal of the cyst in toto is likely to result in undesirable, if not dangerous, hemorrhage. This is because the cyst wall in contact with the renal parenchyma is usually firmly adherent and dissects

away with difficulty and considerable tearing of the adjacent kidney substance, and also because the presence of the cyst has frequently so irritated the parenchyma that the blood vessels supplying this area have become enlarged and tend to bleed profusely. Resection of the free portion, with phenolization of the interior of the unexcised portion of the sac, followed by packing of

Fig. 3.—Removing large cyst from lateral margin of kidney. Only the free portion of the cyst is resected; smooth lining not removed.

the residual cavity with fat which is held in place by mattress sutures of chromic ribbon gut placed through the renal capsule (figs. 3 and 4), is, we feel, the procedure of choice in most of these cases.

While the foregoing procedure will suffice in the majority of cases, in a small number nephrectomy will be found necessary.

A careful examination of the cyst wall, particularly that portion adjacent to the renal parenchyma, should always be made for evidence of malignancy. If doubtful tissue is found, a frozen section should be done if possible; otherwise nephrectomy should be performed immediately.

When a cyst has destroyed the greater part of a kidney, its removal will usually lead to destruction of the remainder of the organ resulting from disruption of the renal blood supply. Therefore, in cases in which more than half of the kidney has been destroyed and the function of the contralateral kidney is adequate, nephrectomy is indicated.

Occasionally a patient with a symptom-producing simple cyst of the kidney may refuse operation, in which event aspiration of the fluid content and injection of 50 per cent glucose solution may be done. This procedure reportedly gives symptomatic relief and in a few cases has even produced cures.

Review of Cases.—Nineteen cases of simple cyst of the kidney are included in this review. Ten of the patients were men and 9 were women. Their average age was 50.2 years, the oldest being 67 years, the youngest 26 years. Fifteen (78.9 per cent) were over the age of 40 years.

The chief complaints were genitourinary tract symptoms, 11; gastrointestinal symptoms, 3; abdominal pain, 2; chest pain, 1; no symptoms referable to the cysts, 2. The most common genitourinary symptoms were urinary frequency, hematuria, renal pain and dysuria. Two patients passed renal calculi. The average duration of symptoms was forty-eight months, the shortest being twelve hours and the longest twenty-seven years.

In only 8 of the 19 cases was a palpable mass detected preoperatively in the affected renal region; of these 5 were tender and 3 not. Practically all the patients were in good general health when first seen. The function in all of the affected kidneys was essentially good.

X-ray examinations showed a definite cystic outline in 8 cases, caliceal distortion in 5, caliceal displacement in 2, a calcified mass in 2, hydronephrosis in 1 and a mass in the kidney in 1.

The preoperative diagnosis was renal cyst in 11 cases, renal cancer in 6, hypoplastic kidney in 1 and nephroptosis in 1.

Five patients had more than one cyst in the affected kidney. One of these (fig. 1) had at least 20 cysts of varying sizes scattered throughout the kidney.

The average size of the cysts was 8.5 cm. in diameter, the largest being 40 cm. and the smallest 0.5 cm.

The right kidney was affected in 10 cases and the left in 9. There was a uniform distribution of the cysts in the inferior pole, superior pole and midportion

1
2
3
Upper pole of kidney repaired after removal of cyst
Small cyst removed
Fat for hemostasis
Ureter
Large cyst on lateral margin removed. Application of 50% carbolic in glycerin to lining of cyst and followed by 95% alcohol
Cysts
Repair of defect with ribbon gut
Defect following removal of small cyst repaired with fat and ribbon gut
Small cysts on surface of kidney incised
Ureter
Defect following removal of large cyst from lateral margin of kidney closed with ribbon gut sutures over fat
Incising small cysts

Fig. 4.—1, the free portion of the cyst on the lateral margin has been resected, and 50 per cent phenol in glycerin is being applied to the lining of the unexcised portion; this is followed by 95 per cent alcohol; the small cyst is similarly treated. 2, repairing defect on the lateral margin with ribbon gut sutures, using fat for hemostasis; fat and ribbon gut are also used to repair the defect following removal of the small cyst. 3, repair of defects after removal of the large cysts; the small cysts on the surface of the kidney are being incised for drainage.

of the kidney. Only 1 small cyst was found (fig. 1) which connected with the renal pelvis or calices.

The operative procedures employed in these cases were nephrectomy in 6, total excision of the cyst with the application of a fat pad to control bleeding in 7, resection of the free portion of the cyst wall with

phenolization and repair by the fat and ribbon gut method in 3, incison of the cyst in 1 and a combination of total excision and resection of the free portion, phenolization or some other method (figs. 1 to 4) in 1. Operation was refused by 1 patient.

Of the 6 nephrectomies, 2 were done because of malignancy in the cysts, 3 because the cysts had destroyed over half of the renal substance, and 1 because the cyst—a calcified one—was found in a hypoplastic kidney with little, if any, function.

It is only during the past two years that we have employed resection of the free portion of the cyst, with phenolization and repair by a fat pad and ribbon gut; therefore there are only 4 cases thus treated included in the series. In these 4 cases, however, this method has demonstrated its superiority over other methods of removal, and we intend to employ it in the future whenever possible. In a case of the senior author's, in which 3 cysts were removed (figs. 1 to 4), one was removed by total excision, during the course of which severe bleeding occurred, which was controlled with difficulty. The other 2 cysts were removed by resection of their free portions followed by phenolization of their bases and subsequent closure of the residual cavity with fat pads and ribbon-gut mattress sutures. In neither of these was bleeding encountered, and the time spent on resecting the 2 was less than that spent in totally excising the first cyst.

Two cysts in this series were found to be malignant. One, a hypernephroma 15 cm. in diameter, contained old blood; the other, a papillary carcinoma 40 cm. in diameter, contained a necrotic material the nature of which was not identifiable. The first patient is alive and well ten years after nephrectomy; the second died of pulmonary metastases one year after nephrectomy.

Pathologic examination of the benign cysts that were removed showed that they practically all had thin fibrous walls, generally consisting of only two layers (not having lining epithelium) and generally showing hyalinized tubular and glomerular remnants. One cyst wall was composed of a porcelain-like material. Another showed calcification and true bone formation.

There were concomitant urinary tract pathologic changes in 7 of the 19 cases. Ureteral calculi were found in 2, and there was 1 instance each of nephroptosis with hydronephrosis, hydronephrosis with chronic pyelitis and ureteritis, pronounced hypoplasia of the kidney, ptosis and chronic pyelonephritis and stone.

The results following operation in the 17 cases of benign cysts were excellent in 14 and good in 1. One patient died of bronchopneumonia six days following nephrectomy, and 1 patient was operated on too recently for proper evaluation. As may be noted from figure 5, there is a definite tendency for the pelves and calices to return to normal shape following the removal of these cysts, even though there has been considerable deformity preoperatively.

POLYCYSTIC DISEASE OF THE KIDNEY

Polycystic disease of the kidney is congenital, probably always bilateral, and progressive in nature.

Symptomatology and Diagnosis.—Painless hematuria is frequently seen in this condition. Dull, aching pain in the kidney regions is also common. Ureteral colic may occur during an attack of hematuria, owing to the passage of blood clots. Urinary infection and its associated symptomatology is often encountered. The onset of symptoms generally occurs during the fourth decade of life.

The results of renal function tests are quite often within normal limits unless the patient is seen in the end stages of the disease, when uremia dominates the picture. Palpable enlargement of one or both kidneys is the rule except in the earlier stages.

The destruction of renal tissue in uncomplicated cases is due solely to mechanical compression by the cysts. However, in many cases infection and hydronephrosis, due to pressure on the ureter or renal plevis, augment this destruction.

The characteristic x-ray picture is that of bilateral "dragon" deformity of the kidney. This may vary considerably in degree in the two kidneys.

Treatment.—Because of the congenital, bilateral and progressive nature of renal polycystic disease, surgical therapy is pretty much limited to the complications arising from it. Even though the disease is progressive, much can be done by careful medical management to prolong and make comfortable the lives of these patients. Destruction of renal tissue, unless augmented by infection, back pressure of urine or calculus formation,

Fig. 5.—Simple renal cyst; preoperative and postoperative pyelograms. A man aged 57 complained chiefly of gastrointestinal burning of fifteen years' duration. The lower pole of his left kidney was palpable but not tender. The preoperative diagnosis was cyst of the right kidney. At operation the free portion of the cyst wall was resected, followed by phenolization and closure with fat and ribbon gut. *A*, preoperative pyelogram. *B*, pyelogram taken three weeks postoperatively. Note tendency for pelvis and calices to return to normal shape following removal of cyst.

usually progresses at a slow rate. The avoidance of infection in any form is of extreme importance. Rest, both physical and mental, avoidance of extremes in temperature due to seasonal changes, particularly cold, and the use of a low protein diet are measures which we have found of value in these cases.

The indications for surgery may be grouped as follows: (1) infection of the kidney and surrounding structures, (2) hemorrhage both in and about the kidneys, (3) pain unrelieved by medical measures, (4) calculus formation, (5) renal neoplasm and (6) rapidly progressing destruction of relatively normal kidneys.

Infection of the kidney (including tuberculosis) which does not yield to medical management and urinary antiseptics demands surgical intervention both to preserve kidney tissue and to prevent general sepsis. Nephrostomy, with adequate drainage, may serve to control this; but if the kidney is found to be functionally dead or is the seat of infection which threatens the life of the patient, nephrectomy must be considered.

In polycystic disease complicated by perinephric abscess, incision and drainage should be employed at the earliest possible moment.

Hematuria, in polycystic disease, is sometimes severe enough to endanger life. Exposure of the kidney, with rupture of the cysts, will control this in some cases. If not, and if the hematuria is unilateral, nephrectomy will have to be resorted to. However, it should be done only as a last resort because, even though the hematuria

Fig. 6.—Polycystic kidney: nephrostomy and rupture of cysts. 1, skin incision for exposure of left kidney. 2, exposing kidney. 3, incising kidney along lateral border for introduction of finger and rupture of cysts below surface of kidney.

is unilateral at the time of nephrectomy, bleeding from the other side may occur at any time.

Intractable pain sometimes occurs in polycystic disease. This can usually be abolished, or greatly lessened, by exposure of the kidney and rupture of the cysts.

Attempts at cystoscopic removal of renal or ureteral calculi in patients with polycystic disease should be made only in the absence of urinary tract infection. Nephrolithotomy and ureterolithotomy are often more conservative in persons afflicted with this disease than procedures entailing transvesical ureteral instrumentation.

The presence, or suspected presence, of a neoplasm in a polycystic kidney is another indication for surgical intervention, provided the functional capacity of the contralateral kidney is adequate to maintain life.

Very fine surgical judgment is needed in deciding whether or not to intervene surgically in cases of polycystic kidneys with relatively normal function but showing evidence of rapid progression of renal destruction despite a suitable medical regimen. If such progression is occurring at a rapid rate in the absence of infection or calculous disease, incision and drainage of the cysts (Rovsing's operation) may do much to prolong the patient's life. If periodic checkups reveal that renal destruction is progressing slowly, over a long period, this procedure, in our opinion, is not justified.

Review of Cases.—From January 1924 to May 1944 there were 53 admissions of 30 different patients to the James Buchanan Brady Foundation of the New York Hospital because of polycystic renal disease and its complications. The reasons for these admissions were diagnosis alone, 29 admissions; operative procedures, 12; medical treatment of complications (uremia, infection, and the like), 11; renal calculus, 1.

There were 12 operations performed on 11 different patients. The average age of these patients was 45 years, the youngest being 27 years and the oldest 67 years at the time of operation. The preoperative diagnoses in these cases were polycystic kidney with infection, 2; neoplasm of the kidney, 6; perinephric abscess, 2; calculus in polycystic kidney, 1; urinary extravasation (ureteral, postcystoscopic), 1.

Only 2 of the 6 patients with preoperative diagnoses of neoplasm were found to have such a lesion. One of these had an exploratory operation; but, no evidence of neoplasm being found, a nephrostomy and incision and drainage of the cysts were done. Grossly the kidney had the appearance of uncomplicated polycystic disease. The patient died twenty-eight days post-

Fig. 7.—Polycystic kidney. 1, rupture of deep cysts through incision along lateral border of kidney. 2, sagittal section showing method of rupturing cysts within kidney.

operatively of uremia, and postmortem microscopic section of the kidney showed the presence of an angiomyosarcoma. No definite gross evidence of neoplasm was seen either at operation or at autopsy. The other patient had a fibrosarcoma arising in a polycystic kidney. She did quite well for five years following nephrectomy but at present (six years postoperatively) is going rapidly downhill as the result of widespread

metastases. This patient had a large cyst of her liver removed seven years prior to the nephrectomy.

There was 1 case in which nephrectomy was performed because of an erroneous diagnosis of neoplasm. The removed kidney showed only polycystic disease, with no evidence of neoplasm. The patient developed pain in the region of the remaining kidney and died eighteen months later of uremia. His death was undoubtedly hastened by the nephrectomy.

Of the remaining 3 patients with preoperative diagnoses of renal neoplasm, 2 were found to have uncomplicated polycystic disease, and incision and drainage of their cysts was done. The third had polycystic kidneys and bilateral perinephric abscesses, which were incised and drained.

There was 1 case diagnosed preoperatively as perinephric abscess that is of considerable interest. This patient, who was known to have polycystic kidneys, entered the hospital complaining of pain in his right flank. Following his admission he underwent a septic course, and a mass rapidly developed in his right lumbar region. This was thought to be a perinephric abscess and an exploratory operation was done, which disclosed a large, almost totally destroyed polycystic kidney. Nephrostomy and incision and drainage of the cysts were done, but the patient died one week later of uremia. The rapidly developing mass was undoubtedly due to rapid increase in the size of the cysts.

The following operative procedures were performed in this series of cases: incision and drainage of the cysts, 2; nephrostomy for drainage, 2; nephrostomy, with incision and drainage of the cysts, 2 (figs. 6, 7 and 8); nephrectomy, 2; incision and drainage of perinephric abscess, 1; incision and drainage of both perinephric abscess and cysts, 1; nephrolithotomy and incision and drainage of cysts, 1; drainage of extravasation from rupture of ureter during pyelography, 1.

Of the 6 patients whose cysts were incised and drained, 1 died twenty-eight days postoperatively of cardiac failure and another seven days postoperatively of uremia. Two others had entirely uneventful postoperative courses but have not been heard from since. The remaining 2 are alive and in good general condition at present, one twenty years and the other eight years following operation. However, both of these have had subsequent admissions to the hospital because of complications. One had an incision and drainage of a perinephric abscess involving the kidney that had been operated on previously; the other was readmitted because of urinary tract infection which developed subsequent to his becoming chilled and catching "cold." Both have normal blood urea nitrogen levels, and their blood pressures are normal for their ages.

There were 2 patients who had nephrostomy for the drainage of infected polycystic kidneys. One died one day postoperatively of uremia. Her blood urea nitrogen was 84 mg. per hundred cubic centimeters on entry to the hospital. Autopsy revealed extensive polycystic disease of both kidneys and cysts of the liver, pancreas, fallopian tubes and peritoneum. The other had an uneventful postoperative course and, when last heard from, several years later, was in excellent general health.

ECHINOCOCCUS CYSTS OF THE KIDNEY

Echinococcus infestation, or hydatid disease, in the human being is common in the wool growing countries, viz. Argentina, Australia, Iceland, New Zealand, northern Africa and southern Europe.

Man is an accidental host in this infestation. The larval worms develop in sheep. Ordinarily the adult worms develop in members of the canine family (dog, wolf, fox, jackal). Man is usually infested from dogs harboring the parasites.

The liver is the most common site of these cysts. Renal involvement occurs in about 2 per cent of infested human beings.

Pathology.—Echinococcal renal cysts are generally unilateral and single. The function of the affected kidney is not as a rule significantly decreased. While the primary site of these cysts is in the parenchyma, they may rupture into the calices, pelvis, or both.

Fig. 8.—Polycystic kidney. 1, incising cysts on surface of kidney. 2, condition after collapse of cysts, and method of placing drains.

Grossly, such cysts present a thick, opalescent wall, which serves to differentiate them from simple renal cysts. Within the larger cysts are numerous smaller, or daughter, cysts, giving a grapelike appearance.

Renal echinococcus cysts are classified as (1) closed and (2) open. The former have no communication with the renal pelvis or calices. Open cysts connect with the pelvis and calices and may be further subdivided into calcified and noncalcified forms.

Symptomatology and Diagnosis.—The x-ray appearance and symptomatology of these cysts usually show nothing to differentiate them from simple renal cysts. However, if the cyst is of the open type, scolices and portions of the cyst wall may be passed in the urine.

Hematuria occurs in some cases of renal hydatid disease and may be due to inflammation of the mucosa of the renal pelvis or calices by an adjoining cyst or by rupture of such a cyst into these spaces. Ureteral

colic may occur as a result of the passage of blood clots due to such hematuria or, in the open type of cyst, by the passage of scolices or portions of cyst wall.

About 50 per cent of patients with hydatid renal disease will have a definite eosinophilia. This may go as high as 20 per cent of the total leukocyte count. Complement fixation tests (Chedini-Weinberg test) will be positive in 80 per cent of the cases. Ninety per cent of these patients will show a positive reaction to the Casoni test.

Treatment.—If not removed surgically, these cysts will eventually lead to death in almost all cases. Exceptions to this are cysts of the closed type which have become calcified. Unless these cause repeated attacks of hematuria they need not be removed surgically.

During operation great care must be exercised in preventing spillage of the cystic contents, since severe anaphylaxis, which is often fatal, may result from such spillage. Also implantation of parasites is likely to occur throughout tissues thus contaminated.

Craig and Lee-Brown,[2] who have had wide experience with the surgical treatment of this lesion in Australia, feel that the following is the operation of choice in cases of noncalcified cysts of the closed type: The kidney is exposed through the lumbar approach and as much of the cystic contents as possible is evacuated through a trocar. The cyst cavity is then filled with alcohol or solution of formaldehyde U. S. P. diluted 1:10. This is allowed to remain in the cavity for three or four minutes and is then, with the remaining cystic contents, evacuated through the trocar, great care being taken to prevent spillage. The cyst wall is then sutured to the abdominal wall with fourteen day chromic catgut. The incision in the cyst wall is left open. A small drain is placed to, but not into, the cyst; this is removed in three or four days. If the cyst is found to connect with other organs, such as the liver or spleen, large drains should be employed.

Nephrectomy is usually the procedure of choice in cysts of the open type. If nephrectomy is technically impossible or is contraindicated because of disease of the opposite kidney, marsupialization of the cyst cavity should be employed. In certain cases of open cysts situated at the poles of the kidney, heminephrectomy may be indicated.

Review of Cases.—During the period covered in this paper, 2 patients were admitted to the Brady Foundation of the New York Hospital with echinococcus cysts of the kidney.

The first (1925) was a man aged 30 who was born and raised in Sardinia, a country where sheep raising is common. Fourteen years prior to his admisison to the hospital he on one occasion passed some "grapes" and pieces of membranes in his urine. There was no recurrence of this until the day before his admission. For two years prior to his entry he had had intermittent pain in the right side of his abdomen, for which an appendectomy had been performed. Physical examination revealed a firm mass in his right kidney region. X-rays showed tremendous distortion of the right renal pelvis. A preoperative diagnosis of echinococcus cyst of the right kidney was made. Exposure of the kidney through the usual lumbar incision disclosed a large cyst at its upper pole. This was opened and found to contain numerous smaller cysts 0.5 to 1.0 cm. in diameter. The wall of the cyst contained many hooklets. The cyst connected with the renal pelvis. A right nephrectomy was performed. Shortly after the operation the patient went into shock, which progressively became worse in spite of all efforts to combat it. He died seventy-two hours postoperatively, with a terminal temperature of 106.4 F. Even though no spillage of the cystic contents was observed at operation, it is possible that a small amount may have occurred, and the patient's death may have been due to anaphylaxis.

The other patient (1936) was a woman aged 24 who had been born and raised in Greece, where she lived on a dairy farm and had a dog for a pet. For several months prior to her entry to the hospital she had had a dull ache in her left flank and one week prior to admission had developed pain in the left flank, frequency, nocturia and hematuria. Physical examination revealed a hard mass the size of an orange in her left kidney region. The x-ray findings were suggestive of a tumor of the left kidney. Exposure of the left kidney through the usual lumbar incision showed its lower pole to be enlarged and covered with an inflamed capsule. It was thought that this was a neoplasm so a nephrectomy was performed. Gross examination of the removed kidney revealed 2 cysts in the lower pole, the larger of which was 6 cm. in diameter. They did not communicate with each other or with the renal pelvis or calices. They contained a clear fluid in which there was a grayish white flocculant and numerous small cysts 1 to 3 cm. in diameter. No free hooklets were seen. Microscopically, numerous scolices were found in the cyst walls and there was an eosinophilic infiltration of the surrounding kidney parenchyma. The postoperative result in this case was excellent.

It is of interest that neither of these patients exhibited an eosinophilia prior to operation. It is regrettable that neither the complement fixation nor the Casoni test was employed in either case.

SUMMARY AND CONCLUSIONS

Simple Renal Cyst.—1. The term "solitary" renal cyst is erroneous and should be replaced by the term "simple" renal cyst.

2. Satisfactory results will be obtained in the great majority of cases of simple renal cyst by resection of the free portion of the cyst wall, with subsequent phenolization of the base of the cyst and closure of the resultant defect with a fat pad and chromic ribbon gut. Nephrectomy is indicated in only a small percentage of cases.

3. Malignancy should be strongly suspected in all renal cysts containing hemorrhagic material; and, unless malignancy can be definitely ruled out, nephrectomy should be done, as approximately 25 per cent of hemorrhagic cysts have been found to be malignant.

Polycystic Renal Disease.—1. Polycystic renal disease is a congenital, probably always bilateral, and progressive pathologic entity.

2. Surgery in this condition is pretty much limited to the complications arising from it.

3. Much can be done in prolonging and making comfortable the lives of patients with polycystic disease by the employment of a judicious medical regimen.

4. Nephrectomy should be done only as a life saving measure in patients who have polycystic kidneys.

2. Craig, G., and Lee-Brown, R. K.: Hydatid Disease of the Kidney, Surg., Gynec. & Obst. **46**: 668, 1928.

Echinococcus Cyst of the Kidney.—1. Renal surgery is indicated for the great majority of patients with this disease.

2. At operation great care must be exercised in preventing spillage of the cystic contents, since severe anaphylaxis, which is often fatal, may result, or parasites may be implanted in the contaminated tissues.

ABSTRACT OF DISCUSSION

DR. WILLIAM F. BRAASCH, Rochester, Minn.: Let me call attention to the desirability of using the term smple cyst rather than solitary cyst. There may be one large simple cyst present in the kidney, but other smaller cysts usually accompany it and often they occur in both kidneys. The term "solitary cyst" therefore is a misnomer in most cases. Multiple large simple cysts frequently are found in the kidney. These cysts may cause urographic deformity which is suggestive of polycystic disease, and they have also been so regarded on surgical exploration. In reviewing the surgical records of patients with simple renal cysts observed during the last five years at the clinic, I found that in 20 per cent of the cases multiple renal cysts of appreciable size were found at operation. In the early days of urography it was thought that the presence of simple renal cysts could always be recognized by the crescentic outline and the other well known deformities of the calices and renal pelvis that usually accompany renal cysts. We were bold to make a positive diagnosis of renal cysts and thought we could differentiate them from renal neoplasm or polycystic disease. We hesitate now to make an exact diagnosis even with the most typical urographic data. Surgical exploration is necessary in practically every case, since the possibility of renal neoplasm must be excluded. Aspiration of renal cysts is not a good surgical procedure and from the therapeutic results often is unsatisfactory. Surgical exploration is preferable in these cases except for a few elderly or very sick patients. In regard to polycystic kidney, although the diagnosis is usually made without too great difficulty from the clinical and urographic data, nevertheless the lesion is often overlooked. Not infrequently only one kidney is enlarged on examination and the other cannot be felt. Urography may show a deformity in the enlarged kidney which is very suggestive of polycystic disease, but the other may have little or no deformity and its function may be normal. It would be easy to infer from this that we are dealing with a unilateral renal condition, possibly neoplasm or one or more simple cysts. As the authors have stated, many complications may occur with renal polycystic disease. The Rovsing operation for polycystic disease would seem theoretically to be a logical procedure. Every now and then somebody reports 2 or 3 cases that have been treated by this method. However, several of the patients on whom this operation was performed at the clinic did not have very satisfactory results. In 2 patients postoperative complications occurred necessitating nephrectomy. The other patients observed did not seem to be greatly benefited by the operation.

DR. GEORGE R. LIVERMORE, Memphis, Tenn.: Solitary cysts of the kidney usually occur at the lower or upper pole. Sometimes, as the authors showed, we find them on the convex border. I had a type once in which the cyst covered the whole anterior surface of the kidney. It was so firmly attached to the kidney that the question was how to get it out. We dissected as much of the sac out as we could and then treated the remainder with an escharotic solution, just as Drs. Lowsley and Curtis have done. Recently some one suggested Zenker's solution, which is an escharotic. I have always been of the opinion that polycystic kidneys should not be operated on unless some definite reason calls for the operation, such as repeated hemorrhage, infection or, as Dr. Braasch suggested, stone. I have operated on quite a number of them for hemorrhage or infection when the hemorrhage had been so severe that the patients were anemic. In such cases we benefit the patient by breaking up as many cysts as possible and ligating all bleeding areas.

Clinical Notes, Suggestions and New Instruments

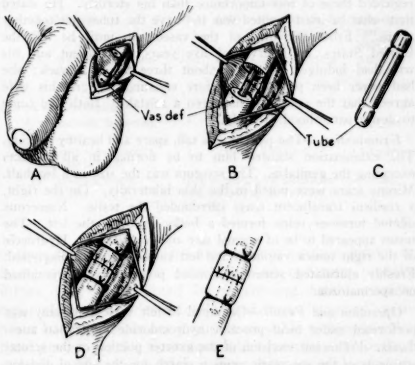
ANASTOMOSIS OF VAS DEFERENS

RESTORATION OF FERTILITY FIVE YEARS AFTER BILATERAL VASECTOMY

LIEUTENANT COMMANDER CHARLES S. CAMERON (MC), U.S.N.R.

It is the consensus that vasectomy, performed for the purpose of sterilization of the male, is irrevocable. This belief is not without advantage in that it undoubtedly deters physicians from advising and laymen from requesting the operation, otherwise so inviting because of its simplicity and effectiveness. Bickham [1] states that vasorrhaphy is occasionally performed in consequence of accidental cutting of the ductus deferens in the course of such operations as herniorrhaphy, a mishap which led Parlavecchio to attempt the first vas deferens anastomosis, according to Thorek.[2]

Reestablishment of continuity and patency of the vas deferens with restoration of fertility in patients previously vasectomized as a measure of contraception has been reported by Strode,[3] Twyman and Nelson,[4] Freiberg and Lepsky,[5] Barker [6] and



A, exposure and preparation of spermatic duct for anastomosis; *B*, insertion of tube; *C*, stainless steel tube showing beveled ends and transverse grooves; *D* and *E*, completed anastomosis.

Nelsen.[7] These cases are of special interest because of the elapsed interval between the time of ligation and cutting of the ducts and the time of anastomosis: seven years in 3 instances and four years in 2.

The technic most frequently employed is that of end to end anastomosis. After the cicatrized end of each segment of the duct has been freshened a suture of catgut or dermal carried on a straight round needle is threaded through the lumen from each end and brought out through the wall of the duct 1 or 2 centimeters from the level of section, and the upper

This article has been released for publication by the Division of Publications of the Bureau of Medicine and Surgery of the U. S. Navy. The opinions and views set forth in this article are those of the writer and are not to be considered as reflecting the policies of the Navy Department.

1. Bickham, W. S.: Operative Surgery, Philadelphia, W. B. Saunders Company, 1924, vol. V, p. 838.

2. Thorek, Max: Modern Surgical Technique, Philadelphia, J. B. Lippincott Company, 1938, vol. III, p. 1964.

3. Strode, J. E.: Vasectomy for Sterilization, J. Urol. **37**: 733 (May) 1937.

4. Twyman, E. J., and Nelson, C. S.: Vas Deferens Anastomosis, Urol. & Cutan. Rev. **42**: 586 (Aug.) 1938.

5. Freiberg, H. B., and Lepsky, H. O.: Restoration of the Continuity of the Vas Deferens Eight Years After Bilateral Vasectomy, J. Urol. **41**: 934 (June) 1939.

6. Barker, J. F.: Anastomosis of the Vas Deferens, West Virginia M. J. **37**: 222 (May) 1941.

7. Nelsen, M. T.: Anastomosis of Vas Deferens: A Case Record with Details of Repair, West. J. Surg. **49**: 152 (March) 1941.

and lower limbs of the vas are brought together over it. Interrupted sutures reinforce the line of union. The lumen suture either is tied over the vas or brought outside the scrotum and removed in seven to ten days. The method of Davis adapts the telescoping technic familiar to urologists as a means of ureteral anastomosis, the proximal portion of the vas being cut obliquely to form an acute angle, which is then drawn into the distal lumen. Bickham describes a maneuver in which a straight round needle is passed into the lumen of the proximal and distal segments to serve as a splint while the anastomosis is effected with interrupted sutures, after which the needle is made to pierce the vas and removed.

REPORT OF CASE

History.—J. D. H., an enlisted man aged 26 in the U. S. Navy, was admitted to the dispensary on April 10, 1944 complaining of a mass in the scrotum. The veins on the left side of the scrotum had been enlarged as long as he could remember. He was uncertain as to the duration of the large soft tumor in the right side of the scrotum but believed that it developed shortly after ligation and cutting of the spermatic ducts in January 1939. This operation was performed just after the patient's marriage and following the decision of himself and his wife to remain childless. Although burdened by a sensation of weight and embarrassed by the size of the scrotum, the patient regarded these of less importance than his sterility. He stated that what he most wanted was to "have the tubes put together again." From the time of the vasectomy until he left the United States, an interval of five years, the patient and his wife had indulged in coitus about three times a week; she had never been pregnant. Before enlisting, he and his wife agreed that the operation had been a mistake. Both had come to desire parenthood ardently.

Examination.—The patient was tall, spare and healthy looking. The examination showed him to be normal in all respects excepting the genitalia. The scrotum was the size of a baseball. Minute scars were noted in the skin bilaterally. On the right, a resilient translucent mass surrounded the testis. Numerous dilated tortuous veins formed a bulky mass on the left. The testes appeared to be of normal size and consistency. Hydrocele of the right tunica vaginalis and left varicocele were diagnosed. Freshly ejaculated semen, examined preoperatively, contained no spermatozoa.

Operation and Result.—On April 15 left varicocelectomy was performed under local procaine hydrochloride infiltration anesthesia. Following excision of the greater portion of the scrotal segments of the spermatic veins a search for the site of division of the left vas deferens was made. This was found at approximately the mid level of the scrotal course of the vas. The club shaped ends, separated by an interval of 8 mm., were cut back until the patent lumen appeared. Microscopic examination of opalescent fluid which oozed from the freshly cut distal portion disclosed no spermatozoa. A hollow stainless steel tube [8] 5 mm. long and of number 21 gage was inserted into the lumen of the proximal and distal segments; this was held in place by means of fine black silk ligatures tied around the vas at the levels of grooves previously cut in the tube. Interrupted sutures were placed at the line of anastomosis. On April 27 a right hydrocelectomy, according to the method of Andrews, was performed under local infiltration anesthesia. This was followed immediately by vasorrhaphy by the technic just described with the single exception that the steel tube used measured 9 mm. in length. This change was made because of the difficulty encountered during the first operation in keeping the smaller tube in place during the anastomosis. No spermatozoa could be found in fluid obtained from the distal vas at the second operation.

On June 29 freshly ejaculated semen contained 15 to 20 vigorously motile spermatozoa per high power field. A spermatozoon count on July 22 was 2,500,000 per cubic centimeter of semen.

8. The tube was made from an ordinary B-D intravenous needle; the ends were beveled and transverse grooves cut near each end with a dental emery wheel.

Council on Foods and Nutrition

SPECIAL ARTICLE

This is the third of a series of articles discussing the significance of protein nutrition in health and disease. This material was prepared by the authors at the request of the Council and has been authorized for publication.

GEORGE K. ANDERSON, M.D., *Secretary.*

PROTEIN NUTRITION IN PROBLEMS OF MEDICAL INTEREST

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AND
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There are many problems of medical interest in which protein nutrition is an important consideration.[1] Some of the more important of these have been listed in table 1.

In this paper we shall limit discussion to (*a*) some of the causes of protein deficiency, (*b*) protein deficiency in some of the more common diseases, and (*c*) the use of food, protein concentrates, tube feeding and parenteral administration of nutrients as they apply to medical disorders.

TABLE 1.—*Problems of Medical Interest Relating to Protein Foods*

Physiologic:
Growth:
Pregnancy
Bone formation
Blood formation
Lactation
Appetite—hunger
Adsorption of other nutrients
Immunity and resistance
Pathologic:
Convalescence
Wound healing
Fatigue
Edema
Obesity
Impaired gastrointestinal absorption
Wasting diseases
Diseases of liver and kidney

CAUSES OF PROTEIN DEFICIENCY

The simplest, most obvious and commonest cause of protein deficiency is lack of sufficient protein in the diet. This may be due to inadequate knowledge of what constitutes a sufficient protein intake, to poor economic status, to misinformation or to the existence of some local or generalized disease with resultant anorexia and dietary inadequacy. Such dietary insufficiency may not be limited to protein but may also include many other nutrients; in fact, uncomplicated protein deficiency

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The products of plasma fractionation employed in this work were developed from blood collected by the American Red Cross, by the Department of Physical Chemistry, Harvard Medical School, Boston, under a contract, recommended by the Committee on Medical Research, between the Office of Scientific Research and Development and Harvard University. Albumin will not be available for general clinical use during the war because of the needs of the armed forces.

1. Stare, F. J., and Thorn, G. W.: Some Medical Aspects of Protein Foods, Am. J. Pub. Health **33**: 1444, 1943.

rarely occurs in man. In addition to lack of an adequate quantity of dietary protein, the possibility that protein deficiency may result from the ingestion of poor quality protein must also be considered. Protein to be adequate for body needs must furnish all of the essential amino acids.[2]

With protein intake adequate as to quantity and quality, there still exist many other important factors which may interfere with the ultimate delivery of adequate protein to the tissues. Digestion may be impaired in the presence of deficient gastrointestinal secretions (stomach, small intestine, pancreas and liver). Impaired absorption may be present in patients with edema, inflammation or tumors of the bowel, in conditions causing hypermotility of the bowel or diarrhea, and as a result of any "short circuiting" process such as a fistula. Protein deficiency is frequently initiated or accentuated, even to the extent of precipitating a deficiency syndrome, by loss of gastrointestinal contents through repeated vomiting or diarrhea, by hemorrhage or by increased demand of protein as a result of fever and increased catabolism. Deficiency in protein may also result from destruction of protein in diseases accompanied by chronic exudation. Excessive loss of protein in the urine of patients with kidney disease and into serous cavities in other diseases may lead to protein deficiency. Furthermore, a negative nitrogen balance, with consequent loss of body protein, may be present for days to weeks following trauma such as burns, wounds or fractures. In certain disorders of the liver, insufficient regeneration of plasma protein may be a cause of protein deficiency. The more general causes of protein deficiency have been summarized in table 2.

TABLE 2.—*Causes of Protein Deficiency*

1.	Insufficient intake of protein, quantitatively or qualitatively
2.	Impaired digestion or absorption of protein foods—chronic diarrhea, fistula and so on
3.	Inadequate synthesis of plasma protein—liver disease
4.	Increased breakdown of body protein stores: febrile states, elevated basal metabolic rate and the like
5.	Excessive loss of protein, such as nephrotic syndrome, ascites or hemorrhage

SPECIFIC DISEASES IN WHICH PROTEIN NUTRITION IS OF PARTICULAR INTEREST

I. *Kidney Disease.*—Regulation of the protein content of the diet is important in the treatment of patients with kidney disease. The particular aspects of kidney disease which merit dietary consideration may be summarized as follows:

1. Poor appetite, nausea and vomiting, usually associated with azotemia, dehydration and acidosis.

2. Proteinuria with its ensuing hypoalbuminemia, edema and signs of protein deficiency.

3. The diuretic effect of dietary protein in patients with edema of renal origin.

1. Poor Appetite, Nausea and Vomiting: Kidney disease is a chronic ailment of considerable severity in many patients, and it may be expected to impair appetite and hence result in a decreased food intake, particularly of protein foods. Furthermore, such factors as edema, uremia, dehydration, acidosis, hypertension and heart failure greatly enhance this tendency. Among lay people there is also the popular fancy that "protein foods are bad for patients with kidney disease," and hence the intake of this particular dietary requirement may be further restricted. It is evident that considerable effort on the part of physician, dietitian and patient must be expended if optimum protein intake is to be maintained. In some cases an optimum protein intake may be attained by increasing total calories, especially carbohydrate foods, and thus "sparing" protein. In other instances it will be possible to increase the total protein intake to a reasonable quantity. If limited protein intake and a high caloric diet are advocated, it is obvious that the protein so used must be of high biologic value. Unfortunately the protein requirements of patients with kidney disease cannot be stated generally, since different forms of the disease may require different management. In table 3 a summary of protein recommendations for the more common forms of kidney disorder is presented.

TABLE 3.—*Protein Recommendations for Patients with Kidney Disease*

Type of Renal Disorder		Rx Diet: Daily Intake			
		Protein, Gm./Kg.	Fluids, Cc.	NaCl	Ash
Edema					
I	Hypoalbuminemia	2-3	1,500	Salt poor	Acid
II	Hypoalbuminemia, hypertension	1-2	1,500	Salt poor	Acid
III	Hypoalbuminemia, hypertension, heart failure	1,000-1,500 cc. milk for 2-5 days; no additional fluid or food			
Azotemia					
IV	Azotemia	0.5-1	4,000	No restriction 1-3 Gm. supplement	Alkaline
V	Acidosis	0.5-1	4,000	No restriction 1-3 Gm. supplement	Alkaline 3-6 Gm. $NaHCO_3$
VI	Acidosis, hypertension	0.5-1	3,000	No restriction	Alkaline 3-6 Gm. $NaHCO_3$
Edema and Azotemia					
VII	Acidosis, hypertension	1	2,000	Salt free	Alkaline
VIII	Hypoalbuminemia, hypertension	1	2,000	Salt free	Alkaline
IX	Acidosis, heart failure	1,000 cc. milk with aluminum hydroxide added (10-20 cc. to be aded to each glass of milk)			

2. Proteinuria and Hypoalbuminemia: The loss of large quantities of protein in the urine, with the consequent reduction of serum albumin level, is a major factor in the production of protein deficiency in patients with kidney disease. It would appear logical that patients with kidney disease and proteinuria would require at least the optimum protein intake of normal individuals of similar age and stature and, in addition, a quantity of protein equivalent to that lost in the urine. Such amounts would of course not provide for any accumulated protein deficit which antedated the onset of treatment and which in many patients may have reached a considerable magnitude because of the insidious nature and long duration of the illness. The need for a high protein intake in patients with proteinuria, hypoalbuminemia and edema appears obvious (table 3, types I, II, III). When uremia and hypertension

2. Stare, F. J., and Davidson, C. S.: Protein: Its Role in Human Nutrition, J. A. M. A. **127**:985 (April 14) 1945.

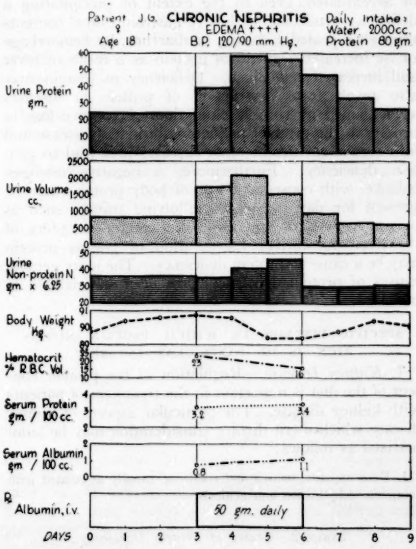
complicate kidney disease, the dietary protein requirements may be modified significantly (table 3, types IV, V, VI), and this is particularly true in the absence of proteinuria, hypoalbuminemia and edema.

Under certain circumstances, particularly in the presence of pronounced anorexia, nausea or vomiting, it may not be possible to correct protein deficits by oral protein administration. Under these circumstances protein hydrolysates diluted to 5 per cent concentration with 5 per cent glucose solution, concentrated human plasma or human albumin solution may be employed with great advantage. A concentrated albumin solution, low in salt content and fortified with tryptophan and isoleucine, would appear to be particularly indicated for patients with hypoalbuminemia and edema. It should be emphasized that the best results in the use of parenteral protein solutions occur in conjunction with an adequate caloric intake, under which circumstance the probability of protein so administered being used to replace depleted protein reserves is greatly increased. Solutions of protein which contain appreciable quantities of salt, i. e., concentrated human plasma, while available as sources of protein, may be almost useless as diuretic agents. Protein hydrolysates are excellent sources of protein building material but have little value as diuretic agents other than the additional urea which is thereby provided.

It is apparent that protein deficiency induced by proteinuria will require long continued and intelligent cooperation by patient, dietitian and physician if a significant change in clinical status is to be effected. An intake of large quantities of diet protein of high biologic value is a sine qua non in patients with hypoproteinemia without excessive nitrogen retention.

3. Protein as a Diuretic Agent: Dietary protein. It is not generally appreciated that in patients with edema without azotemia a high protein diet not only aids in correcting a negative nitrogen balance but also may serve a useful function as a diuretic agent. Dietary protein may be expected to improve urine output as a consequence of (1) an increase in urea available for excretion, (2) an increased sodium excretion with the fixed acid of the protein diet or (3) increased potassium content of protein diet. With many patients, however, even a large daily intake of protein does not result in the disappearance of edema, and by some of these patients additional urea may not be well tolerated. Under these circumstances protein solutions, given intravenously, may act very successfully.[3] Concentrated human plasma solutions have the distinct disadvantage of containing rather large quantities of sodium chloride, and hence the diuretic property of the protein solution may be greatly offset. Recently considerable success has attended the use of "salt poor" concentrated human albumin solutions.[4] The accompanying chart presents a typical experiment in which concentrated human albumin solution was employed as a diuretic agent for a patient with nephrotic syndrome.

Patients who are to receive "salt poor" albumin should be maintained on a protein intake of at least 70 to 80 Gm. daily with a diet of low salt content if maximum benefit is to be derived from albumin treatment. In most instances the optimum daily dose of albumin appears to be 50 Gm. intravenously. It is well not to exceed a rate of administration of 10 Gm. per hour, and it is recommended that 50 Gm. of albumin be made up to 500 cc. volume with 5 per cent glucose and administered at the rate of 100 cc. of solution per hour. The addition of glucose in this concentration to "salt poor" albumin yields a solution which, being isotonic, does not lyse red cells in vitro or, in our experience, in vivo. Albumin may be given advantageously from 1 p. m. to 6 p. m. following an early lunch or in the evening from 7 o'clock to 12 midnight. In this way the intravenous administration of albumin does not interfere with the patient's daily food intake.


Patient J.G. CHRONIC NEPHRITIS Daily Intake:
♀ EDEMA ++++ Water 2000cc.
Age 18 B.P. 120/90 mm Hg. Protein 80 gm
Urine Protein gm.
Urine Volume cc.
Urine Non-protein N gm x 6.25
Body Weight Kg.
Hematocrit % R.B.C. Vol.
Serum Protein gm / 100 cc.
Serum Albumin gm / 100 cc.
℞ Albumin, i.v.
50 gm. daily
DAYS 0 1 2 3 4 5 6 7 8 9

Concentrated human albumin solution as a diuretic agent.

The administration of albumin intravenously is not recommended for patients with pronounced hypertension and cardiac failure.

II. *Diseases of the Liver.*—Cirrhosis: Cirrhosis of the liver, through its impairment of liver function by the replacement of liver tissue with fibrous or fatty tissue and with its attendant portal obstruction and consequent interference with normal gastrointestinal function, frequently is responsible for serious undernutrition. Particularly is protein deficiency likely to be present because it is probable that most of the components of the plasma are synthesized in the liver. The specific manner in which liver damage involves protein metabolism is not known precisely, but the difficulty with which the serum albumin level is maintained in patients with advanced cirrhosis of the liver is common knowledge. On the basis of the observations of

3. Janeway, C. A.; Gibson, S. T.; Woodruff, L. M.; Heyl, J. T.; Bailey, O. T., and Newhouser, L. R.: Chemical, Clinical and Immunological Studies on the Products of Human Plasma Fractionation: VII. Concentrated Human Serum Albumin, J. Clin. Investigation **23**: 465, 1944.

4. Thorn, G. W.; Armstrong, S. H., Jr.; Dickerson, V. C.; Woodruff, L. M., and Tyler, F. H.: The Use of "Salt Poor" Concentrated Human Albumin Solution in the Treatment of Chronic Bright's Disease, to be published.

Patek and Post [5] the advantages of a diet high in protein and vitamin B complex, as well as carbohydrate, have been demonstrated in patients with cirrhosis of the liver and ascites. Practical difficulties are frequently encountered, however, in administering such a diet.

Tube feeding is contraindicated for patients with cirrhosis of the liver unless the absence of esophageal varices has been established. In patients with cirrhosis the serum albumin level may be improved by the administration of concentrated protein solutions (human plasma and albumin) intravenously.[3]

Recent studies indicate that "salt poor" concentrated human albumin solutions administered intravenously may be particularly effective in increasing serum albumin levels and in promoting a diuresis in patients with generalized edema and ascites.[6] The use of "salt poor" concentrated human albumin is a particularly effective form of parenteral protein therapy because of its high colloid osmotic activity and its low sodium chloride content.

Hepatitis: In the past considerable attention has been given to providing a high carbohydrate intake for patients with hepatitis. Therapy was obviously directed toward increasing liver glycogen in the hope that hepatic damage would thus be decreased. More recent experiments and clinical studies indicate the value of protein in protecting liver cells against noxious agents, and hence diets of higher protein content are now being advocated in the treatment of patients with catarrhal jaundice, toxic hepatitis and subacute yellow atrophy of the liver. During the acute phase of the illness it may be necessary to supply protein parenterally (see section on parenteral fluids). Because of the impairment in deaminization which these patients exhibit, protein hydrolysates, if given, must be administered very slowly. Protein solutions such as concentrated human plasma and albumin are to be preferred.

The sulfur-containing amino acids methionine and cystine have been emphasized as the particular protein components of importance in protecting the liver from toxic hepatitis. There are experimental and clinical studies to support their value, particularly in arsphenamine injury and in liver damage from carbon tetrachloride.

Specific suggestions in the management of patients with cirrhosis and hepatitis follow:

1. A daily intake of 75 to 150 Gm. of protein, 300 Gm. or more of carbohydrate and 50 Gm. of fat is recommended. In general it is possible to consume 100 Gm. of protein with three daily meals. The remainder of the protein may be provided in supplementary high protein feedings. (See section on protein therapy.)

2. In the absence of esophageal varices, tube feeding with high protein mixtures may be undertaken. (See section on protein therapy.)

3. Approximately 10 mg. of thiamine, 10 mg. of riboflavin, 250 mg. of niacin amide and 500 mg. of ascorbic acid are given daily during the first three or four days. Later the dosage of all these vitamins may be reduced to approximately one fifth of these quantities. Choline chloride or methionine may be given in enteric capsules 1.0 Gm. twice a day.

4. Intravenous administration of protein, carbohydrate and water soluble vitamins may be indicated, depending on the condition of the patient. Recent studies suggest that a concentrated solution of "salt poor" human albumin administered intravenously may result in a striking rise in serum albumin level and in the replenishment of depleted protein stores.[6]

III. *Diseases of the Gastrointestinal Tract.*—In the Northern section of the United States it is fair to state that most instances of protein deficiency develop secondarily to diseases or malfunction of the gastrointestinal tract. Such illnesses as chronic peptic ulcer with repeated bleeding, chronic pancreatitis, enteritis and ulcerative colitis rank high in the diseases responsible for protein deficiency. The mechanisms by which these illnesses induce deficiency states are decreased appetite or food idiosyncrasies, restricted diets, intestinal hypermotility with diarrhea, draining fistulas and excessive putrefaction. The important role which hypoalbuminemia and consequent edema of the bowel exert on the maintenance and aggravation of abnormal gastrointestinal function is especially appreciated by surgeons in the preoperative preparation of such patients.

Because most of the diseases considered in this group are likely to be chronic and result in more or less permanent structural or functional changes, their seriousness from a nutritional point of view is at once apparent. It is obvious that, although special measures may be introduced from time to time to correct particular deficiencies, it is the adequacy of the daily diet continued over long periods of time which is of prime importance. In this respect the protein content of the diet becomes very important, since in many instances the diet contains only a minimum number of calories and there is little opportunity to effect "protein sparing" with carbohydrate and fat. The desirability and at the same time the difficulty of restoring nitrogen balance in these individuals is evident. Repeated feedings of small quantities of food, the use of protein hydrolysates and concentrates by mouth and intravenously and the administration of blood, concentrated plasma and albumin intravenously may all be required. Increasing the blood protein and hemoglobin level may exert a striking effect on the underlying disturbance in gastrointestinal function. The following is an example:

J. A. S., a man aged 63, entered the hospital with the chief complaint of swelling of the legs of six months' duration. He had been in good health until about ten years prior to admission. At that time he began to be troubled by ulcer symptoms and periods of diarrhea. Subsequently the bouts of diarrhea increased, lasting for months at a time. Secondary anemia had been treated successfully with iron and liver injections. Six months prior to admission he began to have swelling of the legs and scrotum. He rapidly lost strength and some 60 pounds (27 Kg.) in weight. On admission to the hospital he was edematous up to the costal margins. Otherwise there was definite wasting. The skin was dry and scaly, the tongue not smooth, and there were no fissures of the lips. Abdominal examination was unsatisfactory because of the edema, but no enlargement of the liver could be detected. The plasma proteins were 1.5 Gm. per hundred cubic centimeters for albumin and 2.6 for globulin. X-ray studies revealed a duodenal-colic fistula. Whole blood and plasma were administered, but with little effect on the plasma protein level. A nasal tube was inserted and

5. Patek, A. J., Jr., and Post, J.: Treatment of Cirrhosis of the Liver by Nutritious Diet and Supplements Rich in Vitamin B Complex, J. Clin. Investigation **20**: 481, 1941.

6. Thorn, G. W.; Armstrong, S. H., Jr., and Dickerson, V. C.: The Use of "Salt Poor" Concentrated Human Albumin Solution in the Treatment of Cirrhosis of the Liver, to be published.

manipulated under the fluoroscope so that it emerged through the opening of the fistula into the remaining portion of the duodenum. Thus food could be introduced so that it would traverse most of the bowel. By this means the patient was given daily 2,500 calories of a highly nutritious diet containing 100 Gm. of protein as described in table 4. The response of the patient was good, edema decreased, and three weeks after tube feeding the plasma proteins had increased to 2.1 Gm. per hundred cubic centimeters of albumin and 3.3 of globulin.

IV. *Convalescence and Overwhelming Infection.*—Little is known about the alterations in protein metabolism in the presence of severe infections. That rapid wasting of serum and tissue proteins may be an important factor in the death of patients in whom bacterial infection has been well controlled by sulfonamide or penicillin therapy is suggested by the recent reports of Tillett [7] and of Armstrong and his associates.[8] The report of the latter authors mentions 2 patients, 1 a young man with pneumococcic pneumonia involving four lobes and the other a man aged 85 with pneumonia due to the staphylococcus, which complicated prostatic surgery. In both patients the infection was brought under control promptly with penicillin, but because of the serious debility which accompanied the disease the patients had a very prolonged and stormy convalescence. It was apparent in reviewing these cases that massive plasma and whole blood therapy administered during the convalescent period played an important part in combating the hypoproteinemia and anemia which was present in both of these patients, and it is probable that correction of the striking nutritional deficiencies contributed significantly to the eventual recovery.

The role of rapidly developing hypoproteinemia in overwhelming infections needs much study. The direction of possible investigation may be inferred from the large literature on experimental protein deficiency in animals. It is known that an acute dietary protein deficiency superimposed on previously well nourished or chronically protein deficient rats will cause acute contraction in the blood volume.[9] In patients with overwhelming infections, such a factor added to the already disturbed circulatory dynamics may well be a part of the little understood "medical shock" which may persist despite efforts to hydrate the acutely ill patient. A more subtle result of severe protein loss may be failure of proper antibody responses to a disseminated infection. Cannon [10] has shown that rabbits following plasmapheresis fail to develop adequate antibodies. Since we know that penicillin is bacteriostatic in vitro and is bactericidal in vivo by virtue of body immunologic and phagocytic activity, the importance of maintaining adequate protein reserves in the body is evident. Knowledge of these antibody relations is fragmentary at present. There are nonspecific antibodies [11] which appear within the first few hours to days of infection, to be followed in one to two weeks by more specific antibodies. Among the early types of nonspecific antibodies are the anti C substance [12] and the leukocyte promoting factors,[13] both of which have been shown to be globulins. Among the specific antibodies which have to do with crises in pneumonia and convalescence in other infections are the precipitins, complement fixing and protective antibodies of classic immunology. Whether these defense mechanisms are also interfered with by acute protein starvation, as seems likely from Cannon's work, needs investigation.

Recently the Committee on Convalescence and Rehabilitation of the National Research Council has

TABLE 4.—*Formula of High Nutritive Value for Tube Feeding*

Total volume about 1,500 cc. Should be made up fresh daily and kept in a closed container in refrigerator. Mixing in good mechanical mixer is necessary in preparation. Give feedings of approximately 100 cc. conveniently spaced throughout the day and/or night. Material is most readily given with a 50 or 100 cc. syringe through a small nasal tube, which may be left down for three to four weeks. Use alternate nostrils at weekly intervals. The mixture may be given just as it comes from the refrigerator—it is not necessary to warm it.

	Calories	Protein, Gm.	Ca, Gm.	Fe, Mg.	Vitamin A, I. U.	Thiamine, Mg.	Ascorbic Acid, Mg.	Riboflavin, Mg.	Niacin, Mg.
Milk, 1 pt.	330	16.8	0.56	1.0	816	0.19	5	0.86	0.53
Cream, 1 pt. 18 to 20%	998	14.0	0.43	1.0	5,760	0.14	..	0.62	....
Raw liver * (freed of tendons), 4 oz. or 120 Gm.	158	23.0	0.01	9.8	33,000	0.38	37	3.00	17.00
Raw eggs, 4	316	25.6	0.11	5.4	1,980	0.28	..	0.74	0.12
Dried yeast,† 2 tbsp. or 20 Gm.	72	10.0	0.02	4.0	.....	3.20	..	0.80	8.00
Glucose or lactose or sucrose or Karo syrup, 225 Gm. or 7½ oz.	900	....	....	...	.....	....	..	....	....
Whole milk powder, 4 tbsp. or 22 Gm.	109	5.6	0.21	0.4	310	0.07	1	0.35	0.15
Casein, 4 tbsp. or 30 Gm.	120	35.0	....	...	.....	....	..	....	....
Applesauce, apple powder or pectin ‡ (4 tbsp. or 60 Gm. applesauce)	49	0.1	....	0.1	30	....	..	....	0.02
Salt, 10 Gm.									
Totals for foregoing	3,052	119.1	1.33	21.7	41,896	4.26	43	6.37	25.82
Orange juice, 4 oz. or 120 cc. (give half with one of a. m. feedings and half in p. m.)	59	1.1	0.03	0.4	300	0.09	54	0.06	0.26
Complete totals	3,111	120.2	1.36	22.1	42,196	4.35	97	6.40	26.08
Salt concentration about 12 Gm.									

* Ground beef or pork may be alternated with liver.
† If considerable distention or diarrhea develops, substitute with equal amount of wheat or corn germ.
‡ This ingredient is added to prevent diarrhea and must be adjusted to the individual.

7. Tillett, W. S.: The Treatment of Lobar Pneumonia and Pneumococcal Empyema with Penicillin, Bull. New York Acad. Med. **20:** 142, 1944.

8. Armstrong, S. H., Jr.; England, A. C.; Favour, C. B., and Scheinberg, I. H.: Anemia and Hypoproteinemia Complicating Severe Protracted Pneumonia Treated by Penicillin: Role of Specific Supportive Therapy in Recovery, J. A. M. A. **127:** 303-306 (Feb. 10) 1945.

9. Metcoff, J.; Favour, C. B., and Stare, F. J.: Plasma Protein and Hemoglobin in the Protein Deficient Rat: A Three Dimensional Study, J. Clin. Investigation **24:** 82-91, 1945.

10. Cannon, P. R.; Chase, W. E., and Wissler, R. W.: The Relationship of the Protein Reserves to Antibody Production: The Effects of a Low Protein Diet and of Plasmapheresis on the Formation of Agglutinins, J. Immunol. **47:** 133, 1943.

11. Janeway, C. A.: The Plasma Proteins: Their Importance in Clinical Medicine and Surgery, New England J. Med. **229:** 779, 1943.

12. Tillett, W. S., and Francis, T., Jr.: Serological Reactions in Pneumonia with Nonprotein Somatic Fraction of Pneumococcus, J. Exper. Med. **52:** 561, 1930.

13. Menkin, V.: Chemical Factors in Inflammation and Cellular Injury, New England J. Med. **229:** 511, 1943.

published a report [14] in which the large losses of nitrogen and general weight loss following serious trauma and various diseases are stressed. As much as 50 Gm. of protein may be lost per day from exudates or discharges in peritonitis or open wounds. Furthermore, if there are insufficient calories in the diet, protein must be used as a source of calories. The report emphasizes the necessity of high protein intake as part of the general therapy and of beginning it promptly. The importance of good nutrition from the point of view of preventive medicine is emphasized, and optimum nutrition appears to be one of the most important aspects in the general treatment of convalescence and rehabilitation.

V. *Diabetes Mellitus.*—It is well established that in untreated or poorly regulated diabetes large quantities of nitrogen are excreted in the urine (increased D:N ratio) as the result of increased gluconeogenesis (conversion of protein to carbohydrate). As a consequence of this a large protein deficit may occur. Treatment with insulin reduces the rate of protein breakdown. Ample protein in the diet is required, however, if protein deficit is to be corrected. It is suggested that during the first few weeks of treatment 1.5 Gm. of protein per kilogram be allowed adult diabetic patients. Later in the course of treatment 1 Gm. per kilogram, or a minimum of 70 Gm. of protein, should prove ample.

Neuritis is often an accompanying finding in diabetes and is frequently due to a lack of sufficient thiamine. High protein diets in diabetic patients will help to prevent neuritis, since the protein foods are generally good sources of thiamine as well as other members of the vitamin B complex. In the treatment of diabetic neuritis, a diet high in protein content and vitamin B complex must be maintained for prolonged periods.

VI. *Thyrotoxicosis.*—The protein requirement of patients with thyrotoxicosis is greatly increased because of the conspicuous rise in metabolism which occurs in this disease. Weight loss may be extreme, and it is known that muscle protein and liver protein are greatly reduced. The well defined and widespread alteration in muscle function is indicated by muscular weakness, greatly reduced creatinine excretion and decidedly increased creatine excretion. During the early period of specific therapy there is an obvious retention of creatine in these patients. A high caloric, high protein diet is indicated during the early weeks of therapy in conjunction with thiouracil, iodine medication or surgical measures.

VII. *Gout and Allergy.*—Gout and allergy are included in this discussion for the particular reason that dietary restrictions (low purine and elimination diets) imposed on patients with these diseases often result in general restriction of many types of food. Under these conditions evidence of protein deficiency, as well as other nutritional deficiencies, may develop since such peculiar dietary habits may be followed for long periods of time. In table 5 it is obvious that most patients with gout may be permitted unlimited quantities of protein foods listed among the low purine or purine free items.

VIII. *Anorexia Nervosa.*—Protein deficiency frequently exists (*a*) because of insufficient food intake (either carbohydrate or protein) or (*b*) because of peculiarity in food habits. A nutritious diet particularly high in protein because of the latter's satiety value is indicated. Tube feeding may at times be necessary and is of great assistance in correcting the more critical nutritional deficiencies. The ultimate outcome, however, rests largely with the success of a competent psychiatrist.

IX. *Anemia.*—Of the various substances known to be necessary in hemoglobin formation, protein and iron are needed in the largest amounts. A diet may be adequate in protein yet poor in iron. This is particularly true if an appreciable quantity of the protein is furnished by milk which is low in iron. The vast majority of the cases of hypochromic or nutritional anemia seen in this country are due principally to iron deficiency and not to protein deficiency. In fact, a hypochromic anemia due to protein deficiency is rare even in cachectic individuals. This is due in part, no doubt, to the fact that hemoglobin formation takes preference over other body protein needs. However, the mere fact that hemoglobin is a protein would suggest that a good protein intake be maintained in patients with anemia. In the treatment of pernicious anemia, liver has a particular role to play in that it serves as a source of the extrinsic factor, which, however, as far as is known, is not a part of the liver protein.

X. *Hypoglycemia.*—Spontaneous, idiopathic attacks of hypoglycemia occur not infrequently in individuals of nervous temperament in the absence of demonstrable adrenal, pituitary, pancreatic or liver disease. Attempts to correct these episodes by supplementary carbohydrate feedings usually result in a vicious cycle associated with considerable weight gain. A meal high in protein may greatly decrease the wide variations in blood sugar level which occur in such persons. The use of a high protein diet in the treatment of such patients is highly recommended.[15]

TABLE 5.—*Purine Content of Foods* *

50-150 Mg. per 100 Gm.	0-15 Mg. per 100 Gm.
Meats	Vegetables
Fish	Fruits
Sea foods	Milk
Beans	Cheese
Peas	Eggs
Lentils	Cereals

* Patients with gout are allowed 100 mg. of purine daily. The use of milk, cheese and eggs in addition to 100 Gm. serving of meat, fish, sea food, beans, peas or lentils ensures an adequate protein intake of low purine content.

XI. *Hypoproteinemia Primarily Dietary in Etiology.*—Occasionally patients are observed with clearcut signs of protein deficiency but with apparently adequate protein intake and no objective evidence of impaired absorption or utilization. Usually such patients are women, and careful questioning will indicate that the protein intake during the past is not as adequate as one was first led to believe. It is also probable that for some unknown reason the protein requirement is actually increased. These patients can generally be completely cured by simply seeing that high protein diets are consumed. The following history is typical:

E. J. M., a woman aged 29, single, entered the hospital with the chief complaint of intermittent swelling of the feet

14. Malnutrition During Convalescence, Prepared under Direction of the Committee on Convalescence and Rehabilitation of the National Research Council, War Med. **6**: 1, 1944.

15. Thorn, G. W.; Quinby, J. T., and Clinton, M., Jr.: A Comparison of the Metabolic Effects of Isocaloric Meals of Varying Composition, with Special Reference to the Prevention of Postprandial Hypoglycemic Symptoms, Ann. Int. Med. **18**: 913, 1943.

and legs during the last four years. At the onset of her illness four years before she was studied by her local physician and was said to have shown only a low serum protein. On a regimen of bed rest and high protein diet, the edema gradually disappeared after three months. Since then she has been troubled with intermittent edema. Two months prior to admission, the swelling of the legs and feet increased and after a day's work sitting in the office, her hips would be swollen. Physical and laboratory examination, including various liver and kidney function tests, were repeatedly normal except for low plasma protein values of 2.2 Gm. of albumin per hundred cubic centimeters of plasma and 2 Gm. of globulin. The patient was encouraged to consume a diet containing 125 Gm. of protein per day. Response was rapid; four weeks after starting to consume a high protein diet, all signs of edema were gone and the plasma proteins were 3.2 Gm. of albumin per hundred cubic centimeters and 2.6 Gm. of globulin.

TABLE 6.—*Foods Giving Intake of 70 Grams*

1 pint of milk	15 Gm. protein
3 oz. cooked meat	18 Gm. protein
1 egg	6 Gm. protein
3 oz. peas or beans	6 Gm. protein
3 oz. potatoes	2 Gm. protein
Other vegetables (3 servings)	3 Gm. protein
Fruits (2 servings)	2 Gm. protein
6 slices bread	18 Gm. protein
Total	70 Gm. protein

PROTEIN THERAPY

Food.—As in other types of nutritional therapy, good food by mouth is the most effective and satisfying way to administer protein. While temporary therapy with protein concentrates of various types is often valuable and even necessary, it is only a highly nutritious diet over a long period which will give satisfactory results. Increasing the amount of protein in a diet is one of the best general ways to improve a diet, for protein foods are usually good carriers of many other nutrients, such as vitamins of the B complex and minerals. Meats, fish, eggs, milk and cheese, whole grain cereals, beans and peas are all good sources of protein, and as long as a variety of these foods is eaten it is most likely that good quality protein (furnishing all essential amino acids) will be obtained.

In the presence of sufficient calories to supply energy needs, the generally recommended allowance of 1 Gm. of protein per kilogram of body weight for the normal adult is most ample, probably allowing a margin of close to 100 per cent above actual protein requirements. Thus a daily intake of 70 Gm. of protein would be recommended for the average adult. Such an amount would be furnished by consuming the foods listed in table 6. Many variations in these suggested protein foods are possible with the help of food composition tables and the application of nutritional and common sense. High protein diets are obtained simply by increasing the amounts of the better protein foods.

TABLE 7.—*Protein Concentrates for Oral Administration*

Corn germ	20 per cent protein (N × 6.25)
"Dietene"	32 per cent protein
Dried milk	35 per cent protein
Wheat germ	35 per cent protein
Soybean flour	45 per cent protein
Dried yeast	45 per cent protein
"Aminoids"	45 per cent protein
Peanut flour	50 per cent protein
"Amigen"	75 per cent protein
Casein (crude, edible variety)	85 per cent protein

The addition of a glass of milk, an egg, another serving of peas or beans, 1 more ounce of meat and a serving of cheese to the protein foods just listed will raise the protein quantity to 100 Gm. These foods must be consumed, not merely ordered by the physician or served on the tray by the dietitian.

PROTEIN CONCENTRATES—ORAL ADMINISTRATION

It is frequently difficult to consume more than 100 Gm. of protein daily, and a person not feeling too well and one confined to bed may even have difficulty in consuming 60 to 70 Gm. of protein. Thus if it is desired to prescribe a good quantity of protein per day, as it frequently is, one must resort to supplementary nourishments with protein concentrates. For this purpose one may use food preparations rich in protein, or there are available various preparations of hydrolyzed protein rich foods especially prepared for oral administration. Table 7 lists some of these protein concentrates. Dietene, Aminoids and Amigen are trade preparations. The latter two consist of hydrolyzed proteins—Aminoids of a mixture of wheat, beef, milk and yeast proteins and Amigen of an enzymatic digest of casein. In persons with normal gastric and pancreatic function we know of no reason why hydrolyzed proteins should be preferred to unhydrolyzed preparations, and in our experience crude commercial casein has given excellent results as a protein concentrate for oral administration. Aminoids does not support growth in young rats [15a] when it is fed as the sole source of protein.

TABLE 8.—*High Protein Tomato Soup*

	Carbohydrate, Gm.	Protein, Gm.	Fat, Gm.	Thiamine, Mg.	Riboflavin, Mg.	Niacin, Mg.
Butter 35 Gm.	..	..	28	.....	.....	.....
Casein 15 Gm.	..	13	..	.....	.....	.....
Wheat germ ("VioBin") 15 Gm.	7	6	..	0.495	0.180	1.035
Soy flour 10 Gm.	5	5	2	0.055	0.040	0.400
Milk 240 Gm.	12	8	10	0.120	0.500	0.700
Bouillon ½ cube	..	..	..	.....	.....	.....
Tomato purée 2 tbsp.	3	2	..	.....	.....	.....
Salt to flavor (omit in patients with edema or ascites)						
	27	34	40	0.670	0.660	2.135

Total calories, 612; total protein, 34 Gm. Will yield one bowl of soup

To make: Melt butter in the top of a double boiler
Stir in the casein, wheat germ and soyflour
Mix in the tomato purée and bouillin cube (for variety other flavorings may be used)
Add milk gradually
Cook for 10 minutes

On the other hand, Mr. Robert A. Harte of the Arlington Chemical Company, producers of Aminoids, has drawn to our attention unpublished experiments conducted in Whipple's laboratory showing that Aminoids as the sole source of dietary nitrogen is capable of giving satisfactory regeneration of blood protein in anemic and hypoproteinemic dogs. Mr. Harte also informs us that unpublished studies by Co Tui on a series of patients during postoperative convalescence have shown that this product as the sole source of protein can maintain positive nitrogen balance in human beings. In the few protocols of these experiments that we have seen, the Aminoids has been fed in large amounts (34 to 70 Gm. per day in the dog experiments and 150 to 290 Gm. per day in the patients). A more critical test of the nutritional value of a protein is to

15a. Hegsted, D. M.; Hay, A. J., and Stare, F. L.: Unpublished data.

study its performance, whether in growth or in nitrogen balance, at a minimum level of intake, for proteins that are low in any of the essential amino acids become adequate if fed at a sufficiently high level. Rats receiving this preparation frequently have diarrhea. We have also observed the latter symptom in many patients given this preparation.

Protein concentrates may be incorporated into breads, cake, sandwich spreads, desserts, hot cereals and so on, or may simply be stirred up into milk, bouillon or soups. Table 8 gives the formula for a high protein tomato soup that we have found useful, economical and satisfactory as a means of giving supplementary protein. Such a preparation is appetizing and 1 cup furnishes 34 Gm. of high quality protein. If 2 cups a day are given at approximately 9 a. m. and 3 p. m. a total of 68 Gm. of protein will be furnished and the patient's appetite will not be impaired. A third supplementary feeding may easily be given at 9 p. m.

TUBE FEEDING

Not infrequently it is difficult for patients to consume an adequate diet and it may be temporarily impossible for certain patients to swallow food. Under these circumstances one may be forced to resort to tube feeding or parenteral administration of nutrients. Tube feeding, if carefully used, may be an extremely helpful therapeutic procedure in a wide variety of diseases. A pliable rubber tube of approximately 2 or 3 mm. bore is inserted into the stomach. Generally it is less bothersome if passed through the nose rather than through the mouth. The smaller the amount of tubing in the stomach the better. At least 1 foot of tubing should extend out of the nose, and this should be conveniently and securely taped to the cheek and brought up around the eye to the forehead. The tube may be left in position for a week and then removed and shifted to the other naris. If the tube is well supported it will not be uncomfortable. The end of the tube should be kept closed by folding over and fastening with a rubber band. In passing food down the tube, care should be taken to avoid forcing air into the stomach. It is well to withdraw 20 to 30 cc. of air from the tube with a syringe prior to the actual passing of food. Feedings are best given in small amounts of approximately 50 to 100 cc. at hourly intervals. These may be continued throughout the night with little discomfort or inconvenience to the patient. The tube feeding formula given in table 4 has been found to be very useful. It is readily seen that this formula is very nutritious and that its composition with respect to calories and protein can be easily adjusted.

Two complications frequently experienced in tube feeding are distention and diarrhea. Distention may be reduced by giving frequent small feedings and using care not to force air into the stomach with each feeding. Diarrhea may be controlled by varying the amount of applesauce (or commercial pectin preparations may be used). In occasional cases we have used paregoric temporarily. As has been previously mentioned, tube feeding may be contraindicated in the presence of esophageal and gastric varices.

PARENTERAL PROTEIN THERAPY

Parenteral protein therapy consists essentially in the intravenous administration of blood, plasma, albumin or various casein hydrolysates. It should be emphasized that protein therapy by vein does not include the many other nutrients furnished with orally administered protein foods. One should be aware of this if parenteral therapy is continued for any length of time and if this mode of administering nourishment represents the sole or major source.

Concentrated human plasma and albumin solutions are very suitable for intravenous administration. Cost and availability limit their use. If this form of therapy supplements oral ingestion of food and is combined with carbohydrate calories (glucose) a strongly positive nitrogen balance may be attained with moderate quantities of parenteral protein. When parenteral protein must supply a large proportion of caloric needs and can be given in only moderate amounts, it is obvious that protein storage or replacement will be greatly reduced. Recent investigations have shown that human plasma [16] and albumin [17] are inadequate when each is used as the sole source of protein for growth in the rat. They are satisfactory if isoleucine is added to plasma and isoleucine and tryptophan to albumin. Whether these observations apply in human subjects is not known but they deserve consideration.

Mixtures of amino acids are well utilized intravenously as well as orally. Generally these mixtures are actually hydrolysates of casein prepared by either enzymatic hydrolysis ("Amigen") or acid hydrolysis ("Parenamine"). In the latter case tryptophan is added to the hydrolysate to compensate for that destroyed by the acid hydrolysis. The actual amount of amino acids present depends on the completeness of the hydrolysis. These preparations are generally diluted with 5 or 10 per cent dextrose solution to give a hydrolysate concentration of from 2.5 to 5 per cent. The continued use of such preparations frequently results in venous thrombosis at the site of injection, and mild pyrogenic reactions may be experienced. If given too rapidly, nausea and vomiting may result. The mixture presented in table 9 has been found useful for intravenous nutrition.

TABLE 9.—*Mixture for Intravenous Nutrition*

Glucose, 10% solution	3,000 to 4,000 cc.
"Parenamine"* or "Amigen"†	50 to 75 Gm.
"Soln-B with Ascorbic Acid"‡	1 vial
Thiamine	10 mg.
Riboflavin	10 mg.
Nicotinamide	250 mg.
Ascorbic acid	500 mg.

* Frederick Stearns & Company.
† Mead Johnson and Company.
‡ The Upjohn Company.

Mixtures of the purified essential amino acids have been given to man and are reported to have been very well tolerated. Recent studies of Albanese and his co-workers [18] suggest that the unnatural isomers of tryptophan and phenylalanine are not readily utilized by man. When purified amino acids are available in sufficient amounts they should offer an ideal solution to the problem of intravenous protein therapy.

16. Hegsted, D. M.; McKibbin, J. M., and Stare, F. J.: The Nutritive Value of Human Plasma for the Rat, J. Clin. Investigation **23**: 705, 1944.

17. Hegsted, D. M.; Hay, A. L., and Stare, F. J.: Studies on the Nutritive Value of Human Plasma Fractions, J. Clin. Investigation, to be published.

18. Albanese, A. A., with the technical assistance of Frankston, J. E.; Irby, V., and Wagner, D. L.: The Utilization of d-Amino Acids by Man: I. Tryptophan, Methionine and Phenylalanine, Bull. Johns Hopkins Hosp. **75**: 175, 1944.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

535 North Dearborn Street - - Chicago 10, Ill.

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SATURDAY, APRIL 28, 1945

STATISTICS AND PROPAGANDA

Among the major annoyances to American physicians of the last decade have been the loose statements emanating from propagandists in support of proposed changes in methods of medical practice. The death rates in the United States, although they are among the lowest if not the lowest of any great nation in the world, are always described as "shocking" or "amazing." We are told again and again that one third or more of American youths are physically unfit, but they never say physically unfit for what or by what standard. This type of viewing with alarm has now aroused the satire of a writer for the New York *Times*. He says in a recent issue that there is one indispensable rule for viewing with alarm and that is, when quoting, never to use conditional or supplementary clauses. His first example is a statement recently syndicated under a Washington dateline: "Only one American in a thousand is really well fed." Now actually Americans are today about the best fed people in the world. This does not mean to say that the modern advances in the science of nutrition are universally applied. That will no doubt involve a long process of education. No one has yet discovered a technic for overcoming completely the cultural lag between the acquisition of knowledge and its extension to the remotest individual in the population. The truth about nutrition is expressed in the following, which is the whole sentence: "Only one American in a thousand is really well fed, in the sense that no further improvement in his physical condition could be made by changes in his diet."

Innumerable Americans have been startled in the last three years by the amazing misuse of the statistics coming from the Selective Service System and repeatedly quoted by writers in the press and in the reports of various governmental committees. Even Senator Pepper's Interim Report of the Committee on Education and Labor of the U. S. Senate emphasized the statistics although they did use also the saving statement that we are not obviously a nation of weaklings. The writer for the New York *Times* calls attention to the statement "Only one American in ten thousand can really be said to boast of a proper physique." This is a startling indictment, but the sentence, to be finished honestly, must include the clause "taking the Apollo Belvedere as a standard." Scientific writers have emphasized again and again that the examination of millions of young men was conducted for a specific purpose—to obtain an army. Moreover, the standards of induction varied from time to time, beginning with an exceedingly high standard when we were concerned with the raising of an army of a million men for training and proceeding to a somewhat lower standard, involving the acceptance of men with manifest disabilities, when it became necessary to scrape the bottom of the barrel. Under the heading "This Nation's Health" the New York *Times* commentator says:

> That second example of what we may call the missing conditional clause is no doubt considerably exaggerated. But in kind if not in degree it is in the same class with so many statements about the positively frightening percentage of American school children who suffer from physical defects, said "defects" often consisting of troublesome tonsils or a couple of tooth cavities or three pounds under weight. It applies, though in less degree, to the large percentage of men disqualified for military service, where the emphasis on "military" is slighted and then entirely forgotten. We end up by speaking of the American nation as 25 per cent physically unfit.

Similarly we must analyze more scientifically all of the figures now being developed relating to what are called neuropsychiatric disabilities or defects. Many experts are convinced that a large percentage of those who are classified neuropsychiatric under military conditions are able to live efficient, satisfactory lives as civilians in the occupations to which they are adapted. A psychologist has pointed out that the age of 16 years is taken as a maximum for mental sufficiency, so that we need not be alarmed if we are called a nation of 14 year old or 12 year old mentalities. If Thomas Jefferson and Winston Churchill are classified as 16's, the rest of us can be reasonably satisfied to be called 14's.

Not every one is capable of evaluating scientifically the startling statements made by those who would strike fear as part of a propaganda to secure change. Quoting again:

> . . . It is dynamic to say that Americans are really not well fed, if the plain duty of nutrition is to turn us all into Discus Throwers and Venus de Milos, into Johnny Weissmüllers and Babe Diedricksens.
>
> The usual retort is that in order to get people to do things you must throw a scare into them. And yet President Roosevelt said that the only thing we have to fear is fear itself.

MARIHUANA PROBLEMS

For many years medical scientists have considered cannabis a dangerous drug. Nevertheless, a book called "Marihuana Problems" by the New York City Mayor's Committee on Marihuana [1] submits an analysis by seventeen doctors of tests on 77 prisoners and, on this narrow and thoroughly unscientific foundation, draws sweeping and inadequate conclusions which minimize the harmfulness of marihuana. Already the book has done harm. One investigator has described some tearful parents who brought their 16 year old son to a physician after he had been detected in the act of smoking marihuana. A noticeable mental deterioration had been evident for some time even to their lay minds. The boy said he had read an account of the La Guardia Committee report and that this was his justification for using marihuana. He read in *Down Beat,* a musical journal, an analysis of this report under the caption "Light Up Gates, Report Finds 'Tea' a Good Kick."

A criminal lawyer for marihuana drug pedlers has already used the La Guardia report as a basis to have defendants set free by the court.

The value of the conclusions is destroyed by the fact that the experiments were conducted on 77 confined criminals. Prisoners were obliged to be content with the quantities of drug administered. Antisocial behavior could not have been noticed, as they were prisoners. At liberty some of them would have given free rein to their inclinations and would probably not have stopped at the dose producing "the pleasurable principle." A recent tragedy, the case of the hotel bell boy who killed a federal guard in Oklahoma City while under the influence of marihuana, is more eloquent testimony concerning the dangers of the drug.

The report states that the relation between marihuana and crime is unfounded. This opinion, based on tests of 77 prisoners, denies much available evidence. Kolb, nationally known addiction expert, after reading the report stated "one may say of such a drug that, if it were abused as alcohol is abused, it might be an important cause of crimes and other misdemeanors." The annual reports of the League of Nations are filled with cases on the relation between marihuana and crime. Likewise the recent article which appeared in the December 1944 issue of *War Medicine* entitled "The Marihuana Addict in the Army," by Capt. Eli Marcovitz and Capt. Henry J. Meyers, is a devastating refutation of the information contained in the La Guardia report.

The report proposes the use of marihuana in the treatment of drug addiction and chronic alcoholism. Bouquet, the League of Nations expert, and others agree with Kolb that this proposal enters dangerous territory and that the result can only be the substitution of one addiction for another.

The book states unqualifiedly to the public that the use of this narcotic does not lead to physical, mental or moral degeneration and that permanent deleterious effects from its continued use were not observed on 77 prisoners. This statement has already done great damage to the cause of law enforcement. Public officials will do well to disregard this unscientific, uncritical study, and continue to regard marihuana as a menace wherever it is purveyed.

1. The Marihuana Problem in the City of New York: Sociological, Medical, Psychological and Pharmacological Studies, by Mayor's Committee on Marihuana, George B. Wallace, Chairman, Lancaster, Pa., Jaques Cattell Press, 1945.

ORAL PENICILLIN

Penicillin, it has been assumed, cannot be administered orally because of its rapid destruction by gastric acidity.[1] If this antibiotic could be protected from such destruction and still made available for absorption from the small intestine, administration by mouth would be successful. Libby [2] of the Stamford Research Laboratories, American Cyanimid Company, attempted to accomplish this by the use of enteric coated penicillin tablets. These gave unsatisfactory results. Consistent blood levels of penicillin could not be obtained, owing presumably to variations in the time and place of disintegration of the enteric coating.

Reasoning from the fact that little or no digestion of fats takes place in the normal stomach, Libby then tested oral administration of penicillin in the form of an oil or fat solution or suspension. Preliminary tests showed that a fine suspension or dispersion of penicillin salts in various oils can be kept at room temperature for many months without appreciable reduction in antibiotic titer. For clinical tests 150 to 300 Oxford units of sodium or calcium salts of penicillin per milligram were finely dispersed in cottonseed oil. The resulting suspensions were enclosed in gelatin capsules made up to contain from 10,000 to 50,000 Oxford units each per capsule.

Following the oral administration to an adult patient of a single dose of 90,000 units of sodium penicillin in cottonseed oil, 0.4 Oxford unit of penicillin per cubic centimeter was demonstrated in the first urine sample taken twenty-five minutes later. Blood levels of 0.05, 0.04, 0.04, 0.02 and 0.00 Oxford unit per cubic centimeter were obtained at the one, two, four, six and eight hour bleedings. The therapeutic blood level (0.03 unit per cubic centimeter) was reached within about thirty min-

1. Abraham, E. P.; Chain, E.; Fletcher, C. M.; Gardner, A. D.; Heatley, N. G.; Jennings, M. A., and Florey, H. W.: Lancet **2**: 177 (Aug. 16) 1941. Rammelkamp, C. H., and Keefer, C. S.: J. Clin. Investigation **22**: 425 (May) 1943. Rammelkamp, C. H., and Helm, J. D.: Proc. Soc. Exper. Biol. & Med. **54**: 324 (Dec.) 1943.

2. Libby, R. L.: Science **101**: 178 (Feb. 16) 1945.

utes after oral administration and maintained for nearly six hours, or nearly three times as long as the duration of the therapeutic blood level after intramuscular or intravenous injection. The therapeutic blood level apparently can be prolonged indefinitely by repeated oral doses.

A second apparently logical method of preventing destruction of penicillin by gastric acidity would be by the administration of an antacid. Although unsatisfactory results have been reported by earlier investigators,[3] a detailed restudy of this method was undertaken by Charney and his associates[4] of the Wyeth Institute of Applied Biochemistry, Philadelphia.

Rammelkamp[5] found that 60 per cent of intravenously injected penicillin is excreted in the urine. From this percentage the approximate amount of penicillin absorbed into the blood stream can be calculated from urinary recovery. In a control test Charney administered 32,000 units of penicillin without antacid to a fasting adult and recovered about 700 units of penicillin, or 2.2 per cent of the administered dose, from the urine. This 60 per cent excretion was complete within two hours after oral administration, the four, six, eight and ten hour urine samples being negative. From this it can be calculated that approximately 3.7 per cent of the oral dose was absorbed into the blood stream, or that in the control patients 96.3 per cent of the ingested penicillin was destroyed by gastric acidity.

A number of patients were then given approximately the same dose of penicillin dissolved in distilled water containing 3 to 5 Gm. of antacid. In all cases the urinary excretion was increased and prolonged beyond the two hour period by the antacid. The increase was least with sodium bicarbonate, with which the total urinary recovery was only 6.8 per cent of the oral dose. The recovery was greatest with trisodium citrate or with disodium phosphate. With these the average recovery was 20 per cent of the oral dose. Calculated from this recovery, only about 66 per cent of the ingested dose was destroyed by gastric acidity in the presence of these milder antacids. This figure suggests that the oral dose of penicillin should be increased at least threefold above the intravenous dose if orally administered penicillin plus antacid is to produce the same therapeutic effects.

The data were obtained from patients given penicillin orally after an overnight fast. With patients given the same penicillin-antacid mixture two hours after breakfast the average renal excretion was reduced by 30 per cent. Thus given, the calculated required oral dose would be four times the routine intravenous dose.

Similar results were reported at about the same time by McDermott and his associates[6] of the Cornell University Medical College. The Cornell clinician administered 315,000 Oxford units of penicillin orally to four groups of fasting patients. This dose was administered in four forms: (*a*) penicillin in 30 cc. of water, (*b*) penicillin in corn oil, (*c*) penicillin in water preceded by a buffer (magnesium trisilicate) and (*d*) penicillin in peanut oil plus 4 per cent beeswax. In each group of patients a serum concentration of from 0.312 to 1.25 Oxford units of penicillin per cubic centimeter (average 0.78 unit) was demonstrable thirty to sixty minutes later, the highest titers being with the two groups given the aqueous solutions. In these two groups the average titer fell to about 0.5 unit per cubic centimeter by the end of two hours. In patients given penicillin in oil or oil plus beeswax the serum titer continued to rise to an average of about 0.9 unit per cubic centimeter by the end of the two hour period. This continued rise suggested to McDermott that the duration of penicillin therapy might be greatly prolonged by the use of a digestible oil as the vehicle. McDermott recommends an oral dose five times the number of units used in intramuscular therapy.

Thus far McDermott has given 12 patients with pneumococcic pneumonia this recommended fivefold oral dose, and the therapeutic results have been as favorable as those following intramuscular administration of the routine dose. Equally favorable clinical results were afterward reported by György and his associates[7] of Philadelphia and Cleveland. These clinicians first treated 18 men for gonorrhea with 15,000 to 40,000 Oxford units of penicillin every three hours for two to three days, each dose being given in combination of 1 to 5 Gm. of trisodium citrate. In all cases a permanent cure was achieved in from one to three days. Three infants with gonorrheal conjunctivitis, 1 girl with streptococcic vaginitis and 1 boy with discharging streptococcic infection of the middle ear were also rapidly and permanently cured by the same method.

From the reported results, therefore, oral penicillin is therapeutically effective when given either as a suspension in a digestible oil or accompanied by one of the milder antacids. The most favorable vehicle, however, has not yet been determined. With either vehicle the effective oral dose is much larger than the routine therapeutic dose if given intramuscularly or intravenously. This disadvantage is offset by the fact that for oral administration relatively inexpensive crude or impure penicillin presumably would be equally satisfactory.

3. Thompson, G. J.: The Clinical Use of Penicillin in Genitourinary Infections, J. A. M. A. **126**: 403 (Oct. 14) 1944.

4. Charney, J.; Alburn, H. E., and Bernhart, F. W.: Science **101**: 251 (March 9) 1945.

5. Rammelkamp, C. H., and Bradley, S. E.: Proc. Soc. Exper. Biol. & Med. **53**: 30 (May) 1943.

6. McDermott, Walsh; Bunn, P. A.; Benoit, Maria; DuBois, Rebeckah, and Haynes, Willetta: Science **101**: 228 (March 2) 1945.

7. György, Paul; Vandergrift, H. N.; Elias, William; Colio, L. G.; Barry, F. M., and Pilcher, J. D.: Administration of Penicillin by Mouth, J. A. M. A. **127**: 639 (March 17) 1945.

Current Comment

GOVERNOR DEWEY VETOES BILLS TO RECOGNIZE SUBSTANDARD MEDICAL SCHOOLS

The New York legislature this year passed two bills to permit the granting of a medical license to graduates of any medical school in the United States. The New York *Times,* in an editorial comment on one of these bills, April 10, said:

> At one stroke the work of the late Dr. William Welch, Dr. Abraham Flexner and the American Medical Association is to be undone. Thanks to their efforts, our best medical schools have few equals anywhere in the world. If the governor should sign the Milmoe bill, the diploma mills that withered and died would revive and physicians would have to fight again a battle which they thought they had won. The supposed justification for the Milmoe bill is an undeniable shortage of physicians. But this should not be made an excuse for lowering standards of medical education. . . . Whatever our medical situation may be, it is not so low that we must accept an incompetent who has managed to obtain a degree from a second or third rate medical school. Bad medicine can be worse than no medicine.

Word has just been received that Governor Dewey has vetoed both bills. New York State and its governor merit congratulations. Again the standards of medical education and medical care have been saved by the courage and wisdom of a governor, after a legislature failed to recognize its obligation to the people.

SENSITIVITY OF BACTERIA TO PENICILLIN

The frequency of naturally resistant and fast strains of staphylococcus in chronic suppurating wounds were determined by Gallardo [1] under clinical conditions. The group studied comprised 112 cases of traumatic wounds of the extremities with bone involvement in 30 per cent of the cases. All wounds were of at least two weeks' duration and had been previously treated with one or more of the sulfonamide drugs. Cultures were taken before penicillin was started, and follow-up cultures were made in the soft tissue wounds over a period of twelve days and in bone infections over a two month period. Coagulase tests were used to confirm pathogenicity of the strain. Of the 108 strains examined 24, or 22.2 per cent, were either naturally resistant to penicillin or became penicillin fast during the course of treatment. Approximately 9.4 per cent of pathogenic strains of staphylococcus acquired resistance during the course of treatment. Natural penicillin resistant strains occurred in 12.9 per cent among the pathogenic cocci, a figure almost the same as that reported by Spink and his associates.[2] Among the nonpathogenic staphylococci 17.4 per cent were naturally resistant. The exact period at which the organisms become penicillin fast was not determined, but this varied from five to forty days. The faculty and degree of resistance are not correlated with pathogenicity, although the small number of nonpathogenic strains (five) prevents definite conclusions regarding them. Biologic activities were not appreciably different in the penicillin fast and penicillin sensitive cocci. Morphologic changes and a tendency to become gram negative were noted in the penicillin fast cocci, but staining characteristics returned to normal after subcultures. These penicillin fast strains in vitro seem to be more susceptible to the bactericidal power of the blood,[3] but clinically there was no evidence that the course of an infection is altered favorably as the result of the cocci becoming penicillin fast. The existing evidence indicates the high rate of natural and acquired resistance of pathogenic strains in infections and emphasizes the importance of assays of the sensitivity of bacteria to penicillin during the course of penicillin therapy.

1. Gallardo, Edward: Sensitivity of Bacteria from Infected Wounds to Penicillin: II. Results in 112 Cases, War Med. **7**: 100 (Feb.) 1945.
2. Spink, W. W.; Ferris, V., and Vivino, J. J.: Comparative In Vitro Resistance of Staphylococcus to Penicillin and Sodium Sulfathiazole, Proc. Soc. Exper. Biol. & Med. **55**: 207, 1944.
3. Spink, W. W., et al.: Bactericidal Effect of Whole Blood on Strains of Staphylococci Sensitive and Resistant to Penicillin, Proc. Soc. Exper. Biol. & Med. **55**: 210, 1944.

STERILIZATIONS IN THE UNITED STATES

Since 1941 Birthright, Inc., of Princeton, N. J., an organization dedicated to fostering, by educational means, a nationwide program of sterilization, has collected and tabulated reports [1] from the various states on the number of sterilizations performed in state institutions. Each state with a sterilization law has reported. In several instances each state institution has reported separately, and of nearly ninety addressed only one failed to reply. Information on the number of sterilization operations done under the law is therefore probably complete, but this gives little idea of the number done in hospitals by private physicians. Up to Jan. 1, 1944 thirty states with a sterilization law had reported the sterilization of a total of 20,600 insane, 20,453 feebleminded and 1,563 other individuals. California, with over 10,000 sterilizations of the insane alone, led all other states in numbers. Virginia and Kansas were the states with the next largest number of institutional sterilizations. Several states have had their laws declared unconstitutional, and in others the law must be considered as a dead letter at present.

1. Sterilizations Officially Reported from States Having a Sterilization Law up to Jan. 1, 1944, Birthright, Inc., Princeton, N. J.

MALARIA FROM BANK BLOOD TRANSFUSIONS

Two cases of malaria resulting from transfusion of blood which had been stored in a refrigerator have been recently reported by McClure and Lam.[1] The donors responsible for the 2 cases of malaria were related and had spent their childhood in the same small Sicilian town. Symptoms of the disease had not been recognized for twenty-five years. The possibility of transmission of malaria by transfusion of stored blood is now increased with the return of military personnel from malaria infested areas. Consequently when possible the blood from donors who have lived in malaria infested regions should be converted to plasma rather than administered as whole blood.

1. McClure, R. D., and Lam, C. R.: Malaria from Bank Blood Transfusions, Surg., Gynec. & Obst. **80**: 261 (March) 1945.

MEDICINE AND THE WAR

ARMY

THE BATTALION SURGEON

Medical officers serve in many places and in various types of assignments. One of these assignments is that of battalion surgeon. According to the Surgeon General's office, these young medical officers are saving many lives but often receive little credit except from the men they serve. Promotions are slow and they are constantly in physical danger. They hear about the men in the rear hospitals doing professional work of a type similar to that which they expect to do in civil life, but they go on plowing through the mud or sweltering in the heat day by day.

The Surgeon General has arranged for these officers to receive "on the job" refresher courses in the large hospitals when they return to the zone of the interior.

The rotation of medical personnel between front and rear elements has been tried in some places, but it has only a limited application, as green men sent forward are ineffective until they learn their jobs and most of the men in the rear elements are assigned because of peculiar medical skills, making their replacement difficult. The Surgeon General is well aware of all these things and has a sympathetic understanding of the position in which these men find themselves. The excellent results of medical teamwork are due in no small part to them.

ESTABLISH FIELD HOSPITAL FOR CARE OF CHINESE SOLDIERS

Capt. Julius W. Pastor, formerly of Cleveland, is now assisting in the establishment of a field hospital for the care of Chinese soldiers at a field headquarters of the Chinese combat command in South-Central China. Dr. Pastor was sent to his present station to prepare a site for a field hospital to support the Chinese in the South-Central China area and to aid the Americans who are training the Chinese armies in the American technic of modern warfare and in the mechanics and employment of American supplied weapons. Dr. Pastor graduated from the University of Louisville School of Medicine in 1930. He has been in the service since August 1942.

ARMY GENERAL HOSPITAL NO. 32

According to a press announcement made by Headquarters, Communications Zone, European Theater of Operations, Army General Hospital 32, recruited and sponsored by the Indiana University School of Medicine, Indianapolis, and largely staffed by Indiana doctors, dentists, nurses and technicians, was the first major army medical installation to be established in Germany. The unit is now established in the facilities of a former German army hospital. This was the first official word received from the Indiana hospital unit in months.

Opening in its new location with a capacity of 1,000 beds the hospital, under the command of Lieut. Col. Cyrus J. Clark, Indianapolis, added 500 beds in its first two days, a period in which the entire staff was on twenty-four hour emergency duty. In the abandoned German army hospital quarters the 32d staff members discovered a quantity of new and unused German x-ray equipment, and a fluoroscope which will permit four exposures on one film, a relatively new development, and is double the capacity of most of those made in America.

Those now assigned to the hospital as department heads are Major Russell D. Hippensteel, Indianapolis, communicable diseases; Major Brandt F. Steel, Indianapolis, neuropsychiatry; Capt. William D. Campbell, Indianapolis, gastroenterology; Capt. William B. Rossman, Indianapolis, general medicine; Capt. Charles A. Everett, Indianapolis, and Lieut. Col. Carl S. Culberton, South Bend, dental service; Major Charles L. Mahoney, Terre Haute, eye, ear, nose and throat; Capt. John R. Haslem, Terre Haute, neurosurgery; Major Robert L. Ames, New Castle, urology; Capt. Neil Garber, Dunkirk, orthopedic surgery, and Capt. David E. Engle, Royal Center, cardiovascular diseases.

The 32d General Hospital was activated at Camp Bowie, Texas, in January 1943, went to England in September 1943 and operated two hospitals in the Midlands section of England. On D day it sent dispensary teams to the invasion ports, where they treated many of the first casualties returned from France. The unit moved to Normandy in July 1944 and operated from tent headquarters.

GENERAL FOSTER HONORED BY CITY

Brig. Gen. George B. Foster Jr., commanding officer of O'Reilly General Hospital, Springfield, Mo., was chosen Springfield's "outstanding citizen and man of the year" and awarded an engraved bronze plaque by the Springfield chamber of commerce for his activities in coordinating the welfare of the hospital with that of the community, giving an "unusual measure of devotion to the advancement of Springfield and the Ozarks." In paying tribute to General Foster at the award dinner, Major Gen. C. H. Danielson, commanding officer of the Seventh Service Command, said he had distinguished himself "as an administrator, as a medical man and as a leader . . . who has become a part of this community . . . and a compelling force."

NEW PICTURE MAGAZINE FOR AMERICAN AND BRITISH SOLDIERS

A new picture magazine, *Phoenix*, for American and British soldiers fighting together under the South East Asia Command, recently made its debut in India and Burma. It is named after the device which members of the Inter-Allied headquarters staff wear on their shoulder patch. Jointly sponsored by Admiral Lord Louis Mountbatten, supreme allied commander, and Lieut. General R. A. Wheeler, U. S. Army, deputy supreme allied commander, the publication strikes a balance between the things of greatest home interest to boys from the United States and London. It also combines, in about equal parts, the heavier and lighter aspects of fighting a war.

MAXILLOFACIAL INJURIES

A survey of the North African and Sicilian campaigns showed that of the total admissions to hospitals 0.5 per cent were maxillofacial injuries. Of these, 42 per cent were battle casualties. The incidence of maxillofacial injuries compared to total battle casualties was about 2.2 per cent. In the cases reported there were no deaths caused primarily by battle incurred maxillofacial injury.

PROMOTIONS IN THE ARMY MEDICAL DEPARTMENT

The following promotions to the rank of brigadier general (temporary) were recently announced by the War Department:

Col. W. Lee Hart, York, S. C.
Col. Isidor S. Ravdin, Philadelphia.
Col. Thomas D. Hurley, Tulsa, Okla.
Col. George R. Callender, Everett, Mass.

AVIATION MEDICAL EXAMINERS

A class of seventy-three medical officers who recently completed the Aviation Medical Examiners' course were graduated recently from the A. A. F. School of Aviation Medicine, Randolph Field, Texas. Brig. Gen. Eugen G. Reinartz, commandant of the school, presented the diplomas.

ARMY AWARDS AND COMMENDATIONS

Captain George L. Maison

The Legion of Merit was recently presented to Capt. George L. Maison, formerly of Detroit, "for service from July 1942 to July 1944 as chief of the Acceleration Unit, Physiological Branch, Aero-Medical Laboratory. He designed and developed the anti-G suit now used by A. A. F. fighter pilots to prevent blackout and to increase combat efficiency. This suit has had a beneficial effect in raising the score of enemy planes shot down by A. A. F. pilots. He demonstrated courage and forceful effort in developing this suit and demonstrating and instructing its use to the Eighth and Ninth Air Forces personnel." Dr. Maison graduated from Northwestern University Medical School, Chicago, in 1935 and entered the service April 16, 1942.

Captain David Reese

Capt. David Reese, formerly of Charleston, S. C., was recently awarded the Bronze Star. Now stationed in Belgium, Captain Reese was cited for work done in Germany, where he was sent as battalion surgeon to work on German civilians, being there for two months from the middle of October until the middle of December 1944. It was while on this mission that he was cited. He barely escaped capture as the German armies started their big push. Dr. Reese graduated from the Medical College of the State of South Carolina, Charleston, in 1941 and entered the service Aug. 1, 1942.

Lieutenant Colonel Roger O. Egeberg

The Bronze Star was recently presented to Lieut. Col. Roger O. Egeberg, formerly of South Euclid, Ohio. The citation accompanying the award states that "with untiring efforts and with the highest devotion to duty he trained the troops in the Milne Bay, New Guinea, area from Oct. 28, 1942 to Jan. 31, 1943 in mosquito control and discipline and reduced the malarial rate in a highly malarious area. More troops were thus made available for the services at a time when they were so urgently needed." Dr. Egeberg graduated from Northwestern University Medical School, Chicago, in 1929 and entered the service Jan. 10, 1942.

Colonel Jarrett M. Huddleston

The Legion of Merit has been awarded posthumously to Col. Jarrett M. Huddleston, former corps surgeon of the Fifth Army.

Dr. Huddleston, one of the first Regular Army Medical Corps colonels to die in action in this war, was killed in Italy on Feb. 9, 1944. He graduated from George Washington University School of Medicine, Washington, D. C., in 1916 and entered the Army as a first lieutenant the following year. During the first world war he served overseas as regimental surgeon of the first Engineers, First Division, was in six major engagements and received the Croix de Guerre for bravery. Before leaving for his last assignment overseas he was stationed at Fort Beauregard, Louisiana.

Captain Harold A. Timreck

The Air Medal was recently awarded to Capt. Harold A. Timreck, formerly of Washington, D. C., for "meritorious achievement" while participating in aerial combat. Dr. Timreck is also the recipient of the Soldier's Medal for "heroism" in helping to remove wounded airmen from a burning plane. The citation accompanying the award stated, in part, "His courage, coolness and skill on these occasions are in keeping with the highest traditions of the Army Air Forces." Dr. Timreck graduated from Georgetown University School of Medicine, Washington, in 1938 and entered the service May 17, 1941.

Captain Robert Fawcett

Capt. Robert Fawcett, formerly of Pittsburgh, was recently awarded the Bronze Star for valorous action in Italy. He has also been a recipient of the French Cross. Dr. Fawcett graduated from the University of Pittsburgh School of Medicine in 1937 and entered the service Sept. 3, 1942.

NAVY

GUAM FREE FROM MALARIA

Navy medical officers of an epidemiologic unit in Guam who have conducted a survey to determine the prevalence of diseases of military importance recently reported to Marine Major General Henry L. Larsen, island commander, that the natives of Guam are completely free from malaria and filariasis and practically free from syphilis. The unit is under the supervision of Comdr. Raymond H. Goodale, Worcester, Mass., and Lieut. Ralph F. Allen, Miami, Fla.

Carrying field laboratories and medicines to native villages and outposts, the unit has spent more than five months making exhaustive tests on a cross section of the 21,000 natives of Guam. They found a major health problem to be intestinal parasites, particularly hookworm. Examination of 1,021 individuals revealed almost 99 per cent infested with one or more species of intestinal parasites. No malaria originating on Guam has been reported among natives or military personnel. The leading cause of death among adults continues to be tuberculosis, with dysentery the principal cause of death in childhood. Dengue is a definite problem, but no cases of yellow fever or typhus have been found.

Before coming to Guam in 1943 this epidemiologic unit operated at Canton Island, Tarawa, and in the Marshalls. It has been cited by Admiral A. D. Bernhard for "Promotion of Good Feeling Between the Marshallese and Americans."

NAVY AWARDS AND COMMENDATIONS

Commander Harry H. Haight

The Legion of Merit was recently presented to Comdr. Harry H. Haight, formerly of San Diego, Calif. The citation accompanying the award read "for exceptionally meritorious conduct in the performance of outstanding services to the government of the United States as a regimental surgeon attached to the 2d Marine Division, Fleet Marine Force, during action against enemy Japanese forces at Saipan, Marianas Islands, from June 15 to July 5, 1944. Landing shortly after the assault waves, Commander Haight immediately set up an aid station on the beach while under heavy enemy artillery and mortar fire. Although himself wounded on the first day of action, he continued his gallant service throughout the campaign, directing the evacuation of casualties from the beach and the care of the wounded in the face of extremely difficult and hazardous conditions. By his highly skilled supervision of this vital phase of the operations and his expeditious handling of medical supplies to lower elements of the regiment, Commander Haight maintained and enhanced the traditional integrity of his profession." Dr. Haight graduated from the University of Michigan Medical School, Ann Arbor, in 1927 and entered the service Jan. 5, 1941.

Commander Emil E. Napp

Comdr. Emil E. Napp, formerly of New Rochelle, N. Y., was recently awarded the Bronze Star "for meritorious achievement in action against the enemy at Peleliu and Ngesbus Islands, Palau Group, during the period of Sept. 15 to Oct. 20, 1944. Commander Napp, as commanding officer of a medical battalion of a marine division, displayed exceptional zeal and initiative in the medical problems that confronted him. . . . Although his medical companies were under fire on numerous occasions, he so tirelessly supervised and so strictly coordinated the processing, treatment and evacuation of casualties that many lives were saved. His devotion to duty was in keeping with the highest traditions of the United States Naval Service." Dr. Napp graduated from the New York Medical College, Flower and Fifth Avenue Hospitals, New York, in 1933 and entered the service in June 1941. The ribbon accompanying Dr. Napp's Bronze Star will be the seventh to adorn his uniform. He has

already received the Silver Star, the Navy and Marine Corps Medal, the Purple Heart and the Presidential Unit Citation. He also wears the American Defense ribbon for service prior to Pearl Harbor, and his Asiatic-Pacific Area decoration carries four combat stars.

Lieutenant Commander Ernest K. Robinson

The Navy and Marine Corps medal was recently awarded to Lieut. Comdr. Ernest K. Robinson, formerly of Kansas City, for "unusual skill at the operating table" aboard an aircraft carrier in the Pacific, November 25. He is credited with saving the lives of numerous men "thought to be mortally wounded by fire and shrapnel." Dr. Robinson graduated from the University of Pennsylvania School of Medicine, Philadelphia, in 1929 and entered the service in October 1942.

Commander Douglas D. Martin

Comdr. Douglas D. Martin, formerly of Tampa, Fla., was recently commended by Admiral C. W. Nimitz. The citation read "for meritorious and efficient performance of duty as chief of medical service at a fleet hospital in the South Pacific area from May 21, 1943 to March 25, 1944. During this period Commander Martin displayed exceptional professional skill in handling the many medical problems which arose. Through his organizational ability and thorough indoctrination of the medical officers and nurses under his supervision he contributed materially to the efficient administration of the hospital to which he was attached. His initiative and leadership were in keeping with the highest traditions of the naval service." Dr. Martin graduated from the University College of Medicine, Richmond, Va.

MISCELLANEOUS

NURSES STUDY VETERANS' FACILITIES

With a view to recommending ways to better the nursing service of the Veterans Administration, the National Nursing Council for War Service named a committee of nurses to visit different types of facilities in April and report on procedures found in operation there and conditions under which nurses work. The formal study was undertaken with the full cooperation of Gen. Frank T. Hines, administrator, and Miss Gwen H. Andrew, superintendent of nurses for the Veterans Administration. The committee which made the study had as chairman Miss Anna Taylor, assistant editor of the *American Journal of Nursing*, who visited all three facilities. Miss Elizabeth Bixler, dean of the School of Nursing of Yale University, assisted Miss Taylor in the study of the neuropsychiatric hospital at Bedford, Mass. Miss Esta McNett of Lowman Pavilion, Cleveland City Hospital, cooperated in the study of tuberculosis nursing at Rutland Heights, Mass., and Miss Margene O. Faddis, associate professor of medical nursing, Western Reserve University, in the visit to the general medical and surgical facility at Aspinwall, Pa.

Mrs. Elmira B. Wickenden, secretary of the National Nursing Council, stated that the Veterans Administration needs 1,000 nurses immediately and an additional 1,000 by June 30, according to figures announced by the administration. Since the number now employed is approximately 4,000, filling the need presents greater problems than the number would seem to indicate. If the nurse draft bill now before Congress is passed, nurses employed in veterans' facilities would be exempt. However, the initial base pay of a Veterans Administration nurse is $1,800 without maintenance, as compared with $1,800 with full maintenance in Army and Navy Nurse Corps. While nurses in the military services are officers, Civil Service rates the veterans' nurses as "subprofessional." The latter do not receive pensions, care while ill and the various other benefits under the G. I. bill. Mrs. Wickenden declared that "one good way to assure adequate nursing service for veterans would be to review the whole problem of pay, professional status and working conditions in the service and make them conform more nearly to the best practices."

The National Nursing Council for War Service is made up of representatives from the major national nursing organizations, the American Hospital Association and the federal nursing services.

RETURNS TO ACTIVE SERVICE

Dr. Derek Denny-Brown, professor of neurology in the Harvard Medical School, Boston, and director of the Neurological Unit, Boston City Hospital, has been granted leave of absence from these institutions. He will return to active military duty as a brigadier general with the British forces in India and Southeast Asia. In 1941, after two years of service in the field, he was temporarily released by the British army to carry on research and teaching in the United States. He plans to resume his work in Boston at some later date. Dr. Denny-Brown graduated from the University of New Zealand in 1924.

WARTIME GRADUATE MEDICAL MEETINGS

The following subjects and speakers for Wartime Graduate Medical Meetings have just been announced:

California

Station Hospital, Fort Mason: Diagnosis of Atypical Anemias, Dr. Stacy R. Mettier, May 18.

U. S. Naval Hospital, Treasure Island: Surgery of the Hand, Dr. Edmond Dana Butler, May 4; Selection of Time for Ambulation of General Surgical Patients, Dr. Horace McCorkle, May 18.

Birmingham General Hospital, Van Nuys: A Comparison of Protozoal and Bacillary Dysenteries, Dr. John Kessell, May 9.

Camp Haan, Riverside: Rehabilitation, Lieut. Comdr. H. W. Craig Jr. (MC), U.S.N.R., and Lieut. Comdr. E. W. Lowman (MC), U.S.N.R., May 1.

Station Hospital, Camp Cooke: Recent Developments in Surgical and Public Health Antisepsis, Dr. Frederick Moore, May 2.

Hoff General Hospital, Santa Barbara: Recent Developments in Surgical and Public Health Antisepsis, Dr. Frederick Moore, May 2.

Torney General Hospital, Palm Springs: Some Fundamental Considerations for the Understanding of Psychiatry, Dr. Glen Meyers and Comdr. Walter Rapaport (MC), U.S.N.R., May 1.

U. S. Naval Hospital, Camp Pendelton, Oceanside: Coccidiodomycosis—Plastic Surgery in Defects of the Head and Neck in Conjunction with Colored Surgical Movies, Dr. Edward S. Lamont, May 10.

U. S. Naval Hospital, Corona: Aviation Medicine, Dr. Fred Helmholtz, May 10.

A. A. F. Regional and Convalescent Hospital, Santa Ana: Repair of the Facial Nerve, Dr. Pierre Viole, May 1.

U. S. Naval Air Training Station, San Diego: Thoracic Surgery, Dr. John Jones and Lieut. Comdr. J. E. Dailey (MC), U.S.N.R., May 4.

Kansas

A. A. F. Regional Hospital, Smoky Hill Army Air Field, Salina: Orthopedic Surgery, Dr. A. E. Bence, May 10.

Michigan

Percy Jones General and Convalescent Hospital, Battle Creek: Cerebral Arteriography, Dr. C. F. List, May 7; Some Phases of Urology, Dr. Reed M. Nesbit, May 14; Subacute Bacterial Endocarditis Confined to the Right Side of the Heart, Dr. Paul S. Barker, May 21; The X-Ray Examination in the Diagnosis of Urinary Tract Disease, presented by staff members of X-Ray and Urology departments, Percy Jones General and Convalescent Hospital, May 28.

Virginia

A. A. F. Regional Hospital, Langley Field: Aviation Medicine, Dr. L. G. Lederer, May 25; Fundamentals of Plastic Surgery, Dr. Robert E. Moran, May 25.

U. S. Naval Hospital, Portsmouth: Shock, Burns and Plasma, Dr. E. I. Evans, May 11.

ORGANIZATION SECTION

Washington Letter

(From a Special Correspondent)

April 23, 1945.

Better Pay Urged for Veterans Administration Doctors

Low pay of Veterans Administration doctors is blamed for the agency's inability to keep its medical and surgical staffs at desired strength. More than 400 of its doctors have entered military service; but about 300, including some of the same men, have since been assigned by the Army and Navy to Veterans' hospitals. Veterans Administration salaries for doctors are said to have become less attractive as the income opportunities of private practitioners have increased. Five salary grades are provided for veterans' doctors, ranging from $3,200-$3,850 a year in the lowest grade up to $6,500-$7,500 in the highest. Most of its doctors are in the first three grades, with maximum salaries of $3,850, $4,600 and $5,400. Against these salaries are cited Department of Commerce figures on average physicians' incomes, which before the war went up and down, abreast of general business conditions. In 1929 the average income for practitioners was $5,298; in 1935 it was $3,629; in 1936 it was $4,143. The average net income for specialists in 1936 was $6,521. Through good times and bad the average physician is said to be able to make from $3,600 to $5,200 a year under his own management.

Research Board for National Security Lauded

A favorable reception has been given the bill now before Congress which would make the new Research Board for National Security a direct government agency rather than a subsidy of the National Academy of Sciences. On the joint request of War Secretary Stimson and Navy Secretary Forrestal, Dr. Frank B. Jewett, National Academy president, set up the board composed of twenty leading United States scientists, including medical members. Purpose of the measure is to take over the activities of the Office of Scientific Research and Development when the war ends. This agency has coordinated efforts of leading research men in the development of war weapons and medical procedures.

National Baby Week Announced April 29 to May 5

National Baby Week is to be celebrated from April 29 to May 5, it is revealed. Its purpose is to encourage healthy babies to assure a healthy future America. A record number of three million new wartime babies and their mothers will be the special recipient of honors. Increasing shortage of doctors and nurses is said to emphasize the need of educating mothers in the proper care of infants. The National Baby Week program is designed to give young mothers the latest scientific information. Publications, displays and lectures will stress correct feeding, fresh air, exercise, early training in good habits and cleanliness. The seventh annual National Posture Week is also announced for May 7 to 12, with emphasis on the fact that 1945 was designated "Physical Fitness Year."

San Francisco Conference

Informed opinion here is that the San Francisco conference, bearing so importantly on health and medical problems throughout the world, will lay a solid foundation for a workable peace treaty to follow. Washington representatives of the United States delegation left the Capital in optimistic spirit about the successful outcome of the meeting.

Congress Probe of Kenny Charge Sidetracked

Congress has sidetracked—at least temporarily—a proposal that it investigate charges that Sister Elizabeth Kenny's infantile paralysis treatment program has been subjected to organized opposition. Representative O'Toole, Democrat of New York, asked for creation of a special committee to determine whether or not there had been "organized opposition" to the Australian nurse and her methods and whether she had been "deliberately impeded." The House Rules Committee took no action on the O'Toole proposal

Capital Notes

District of Columbia legal officials are endeavoring to learn whether or not there is legal authority for the twelve year old practice at Gallinger Hospital of sterilizing feebleminded persons on the authority of relatives and hospital physicians. Dr. Daniel L. Seckinger, superintendent of the hospital, believes that a special three man committee from the hospital should determine the necessity of such operations.

Sterilization of persons who "by reason of mental deficiency or viciousness are incapable of evaluating consequences of their behavior" is well recognized medical procedure says Health Officer George C. Ruhland, who told District of Columbia commissioners that there is no legislation on the subject here.

Chairman Bilbo of the Senate District Committee has asked for early and favorable action by the Senate on a bill to use federal funds for a postwar 1,500 bed hospital center in Washington. The bill, sponsored jointly by Bilbo and Senator Tydings, Democrat of Maryland, was unanimously reported out of the Senate District Committee. It authorizes a center estimated to cost between 7 and 12 million dollars, with participating hospitals required to share one third of the cost. The nucleus of the center will be Garfield, Emergency and Episcopal Eye, Ear, Nose and Throat hospitals.

Official Notes

DOCTORS LOOK AHEAD

When the script for Doctors Look Ahead has been given final approval it is mimeographed. A dozen or more copies are required for a broadcast, since the performance of a script for Doctors Look Ahead involves eight actors, one or two sound men, an engineer, an announcer, an orchestra conductor and at least one doctor, all of whom must have scripts.

Production is under the direction of Norman Felton, an English born actor and producer, who has been on the stage since he was 8 years old. In this country he has been director of the St. Paul Civic Theater, the Civic Theater of Saginaw, Mich., and the Cleveland Civic Theater of Allied Arts. He has taught experimental playwriting and radio script writing at the University of Iowa and is the recipient of a Rockefeller Foundation fellowship in playwriting.

Under the direction of the producer, action, sound, music, announcing and the medical summary are woven into a precisely timed piece of radio entertainment with a strong dash of instruction and a considerable potentiality for motivation.

Doctors Look Ahead will present the following programs in the next three weeks:

May 5. Child Health. Speaker, Dr. George K. Anderson, M.D., Secretary, A. M. A. Council on Foods and Nutrition.

May 12. National Hospital Day and Fiftieth Anniversary, Chicago Lying-In Hospital. Broadcast will be from De Lee Hall at the hospital.

May 19. Time relinquished to U. S. Public Health Service for National Induction of Cadet Nurse Corps.

Doctors Look Ahead is heard on one hundred and twenty-three stations of the National Broadcasting Company network each Saturday at 4 p. m. Eastern War time (3 p. m. Central War Time, 2 p. m. Mountain War Time and 1 p. m. Pacific War Time). Some stations may record the program and broadcast it at a time which suits their schedule better. Local newspaper radio announcements should be consulted.

Bureau of Information

ARKANSAS AND UTAH COUNTIES

Dr. W. R. Brooksher, secretary of the Arkansas State Medical Society, and Mr. W. H. Tibbals, executive secretary of the Utah State Medical Society, have recently returned completed summary sheets from each county in their respective states.

The accompanying tables present some of the data on counties from each of these states. The column listing the number of persons per telephone is used as one index of the economic status of the area. Many physicians over 65 years of age are carrying on large practices and are doing much to maintain the health of communities. They are not included in computing the physician population ratio, however, as the future needs of the communities will be largely dependent on younger physicians.

A current knowledge of needs of communities for doctors is essential if adequate help is to be given veteran medical officers in their problems of medical practice. These needs can be indicated on the summary sheets under "Remarks" by the state and county secretaries and are then available to inquiring medical officers.

With the information available on a completely filled out summary sheet, it is readily possible for an interested medical officer to make an initial selection of areas in which he might like to practice. The further investigation through the state and county medical societies is thus greatly facilitated, and much unnecessary correspondence and perhaps travel may be avoided. In many communities vacancies are being held open for physicians now in military service. The number of physicians listed may therefore be misleading, and consequently direct correspondence with the county medical society will always be necessary.

Arkansas

County[1]	Principal Cities[2]	Population	Physicians Under 65	Persons per Physician	Persons per Telephone[3]
Arkansas		**22,654**	8	2,832	28.6
	Stuttgart	5,628			
Ashley		**24,630**	8	3,079	40.1
	Crossett	4,891			
Benton		**30,177**	10	3,018	16.2
	Rogers	3,550			
	Siloam Springs	2,764			
Boone		**13,555**	5	2,711	14.6
	Harrison	4,238			
Clark		**20,837**	8	2,605	27.1
	Arkadelphia	5,078			
Crittenden		**40,209**	11	3,655	102.8
	West Memphis	3,369			
Faulkner		**21,770**	13	1,675	31.4
	Conway	5,782			
Garland		**37,888**	42	902	14.1
	Hot Springs	21,370			
Greene		**24,282**	12	2,024	44.6
	Paragould	7,079			
Independence		**20,156**	10	2,016	38.5
	Batesville	5,267			
Mississippi		**77,558**	30	2,585	60.0
	Blytheville	10,652			
	Osceola	3,226			
Sebastian		**58,253**	36	1,618	13.0
	Fort Smith	36,584			

Utah

County[1]	Principal Cities[2]	Population	Physicians Under 65	Persons per Physician	Persons per Telephone[3]
Box Elder		**17,838**	6	2,973	14.1
	Brigham	5,641			
Cache		**26,250**	16	1,641	10.4
	Logan	11,868			
Carbon		**20,611**	16	1,288	21.8
	Helper	2,843			
	Price	5,214			
Davis		**22,784**	7	3,255	21.9
	Bountiful	3,357			
Duchesne		**7,240**	2	3,620	35.3
	Roosevelt	1,264			
Garfield		**3,461**	1	3,461	28.1
	Panguitch	1,979			
Iron		**7,764**	4	1,941	11.7
	Cedar City	4,695			
Salt Lake		**230,447**	171	1,348	7.9
	Salt Lake City	149,934			
	Murray	5,740			
Sevier		**9,548**	7	1,364	14.3
	Richfield	3,584			
Tooele		**12,418**	5	2,483	29.0
	Tooele	5,001			
Washington		**7,486**	3	2,495	14.5
	St. George	3,591			
Weber		**70,247**	35	2,007	9.6
	Ogden	43,688			

1. Bureau of Census, estimated population 1943.
2. Bureau of Census, population 1940.
3. Based on 1940 figures, Am. Tel. & Tel. Co.

Medical Legislation

MEDICAL BILLS IN CONGRESS

Change in Status.—H. R. 2689, the agricultural appropriation act for 1946, has passed the Senate. When the bill was before the Senate for consideration, an amendment was submitted as follows: *"Provided,* That, in assisting farmers in the organization and administration of associations and groups for medical care, the Farm Security Administration shall permit the members of associations or groups to have free choice in the selection of practitioners from those available practitioners who are licensed under state laws." The amendment was rejected.

Bills Introduced.—H. R. 2920, introduced by Representative Rogers, Massachusetts, proposes to establish a Department of Veterans' Affairs with a Secretary of Veterans' Affairs at its head. H. R. 2939, introduced by Representative Randolph, West Virginia, proposes to prevent discrimination against blind persons and persons with impaired visual acuity in the administration of the civil service laws. H. R. 2946, introduced by Representative May, Kentucky, proposes to authorize the appropriation of such sums as may be necessary to enable the National Academy of Sciences to provide for scientific research and advancement in the interest of national security. H. R. 2969, introduced by Representative Eberharter, Pennsylvania, proposes that any individual who served as an officer in the Medical Department of the Army or Navy during the war period who was discharged or separated from service under honorable conditions and who, prior to such discharge or separation, held a license to practice medicine or dentistry under the laws of a state shall be entitled to receive a certificate which will authorize him to engage in any state in the practice of the particular class of medicine or dentistry covered by the state license held by him. The Secretary of War and the Secretary of the Navy, it is contemplated, will jointly prescribe regulations with respect to the making of application for and the issuance of such certificates, which will be issued, so far as practicable, at the time of discharge or separation from the land or naval forces.

DISTRICT OF COLUMBIA

Change in Status.—S. 223 has been reported to the Senate, with an amendment, to provide for the establishment of a modern, adequate and efficient hospital center in the District of Columbia. The purpose of this bill, according to the committee report, "is to give to the city of Washington a modern, adequate and efficient hospital center, with a capacity of not more than 1,500 beds, fully equipped, and with complete facilities for diagnosis and treatment in all the specialties."

STATE LEGISLATION

Delaware

Bill Introduced.—S. Sub. for S. 24 proposes to condition the issuance of a license to marry on the presentation by each party to the proposed marriage of a physician's certificate, based on a physical examination and a standard serologic test, that the party is not infected with syphilis or, if so infected, is not in a stage of that disease which is or may become communicable to the marital partner.

Florida

Bills Introduced.—S. 44 proposes to condition the issuance of a license to marry on the presentation by each party to the proposed marriage of a physician's certificate based on a physical examination and a standard serologic test that the party is not infected with syphilis or, if so infected, is not in a stage of that disease which is or may become communicable to the marital partner. S. 45 proposes to require every physician attending a pregnant woman for conditions relating to pregnancy to take or cause to be taken a sample of venous blood at the time of his first professional visit and to forward that sample to a recognized laboratory for a serologic test for syphilis. S. 144 proposes to direct the state board of health to make a survey of the location, size and character of all existing hospitals, of auxiliary diagnostic facilities and of local health unit facilities and to evaluate the sufficiency of those facilities to supply the health needs of the people. The board is to be authorized to accept on behalf of the state and to expend for the purposes indicated any funds made available by the federal government or any agency thereof. Committee Sub. for H. 26 proposes to authorize the establishment of the South Florida State Hospital to be located within the county of Highlands. The governing board of the hospital is directed to cooperate with the federal government or any agency thereof in connection with the establishment of the hospital and to accept donations of funds and property in connection therewith. H. 154 proposes to make it the duty of the state board of health to formulate a plan for the care and treatment of indigent persons suffering from cancer and to establish and designate standard requirements for the organization, equipment and conduct of cancer units or departments in general or private hospitals or private clinics in the state. H. 210 and S. 146 propose to authorize the state board of health to accept any funds or grants or supplies, equipment or goods made by the federal government.

Illinois

Bills Introduced.—S. 325 proposes to require a practitioner of the healing art or a hospital on demand to deliver all x-ray photographs in his or its possession to any person whose body or any part thereof is represented by the photograph and who has paid for the photography. A violation of the act is to be punishable by a fine of not less than 50 dollars nor more than 250 dollars for each offense. S. 336 proposes to create a commission to investigate the hospitalization and medical care of residents of Illinois, to study the hospitalization and medical needs of the state and to report its findings and recommendations concerning the establishment of a state system of hospitalization and medical care. H. 407 proposes to limit the retail sale or distribution of any sulfanilamide derivatives to sale or distribution on the prescription of a licensed physician, dentist or veterinarian. H. 477 proposes that any person who has paid anything of value as consideration for the x-ray photography of any part of his body has such title to the finished photographs or plates as will enable him to maintain, after demand and refusal to surrender possession of them to him, an action of replevin for them. A judgment in any such replevin action arising out of the unlawful detention of x-ray photographs or plates shall include, in addition to the relief ordinarily provided in replevin actions, an award of punitive damages equal to five times the original cost of the x-ray photography as charged the plaintiff.

Maine

Bills Introduced.—S. 428 proposes, in effect, that all laws, rules and regulations for the purpose of signing certificates for committing persons to state institutions, and to which physicians of other schools of medicine are subject, shall apply equally to osteopathic physicians and that all reports and health certificates made by osteopathic physicians shall be accepted by the officers of the departments to which the same are made equally with the reports and health certificates of physicians of other schools of medicine. H. 1476 proposes that a person who comes in direct contact with the students of any public school shall not enter on his duties until he has filed with the appropriate school authorities a certificate from a licensed physician that he has examined the school employee and has found him free from all communicable and infectious diseases.

Maryland

Bill Introduced.—H. 786 proposes to prohibit all advertising by chiropractors, osteopaths, physiotherapists or naturopaths except (1) the use of a personal professional card of not more than 3½ inches by 2 inches on which may be printed only the practitioner's name, title, address, specialty, telephone number and office hours; (2) removal notices limited in size and scope; and (3) that not more than two signs on the door or wall of the building wherein the practitioner practices on which may be placed the name and title or degree of such practitioner, the letters of which shall not exceed three inches square.

Massachusetts

Bills Introduced.—H. 1792 proposes to prohibit, except on the written prescription of a licensed physician, dentist or veterinarian, the retail sale or distribution of aminopyrine, barbituric acid, cinchophen, dinitrophenol, sulfanilamide or their derivatives. H. 1774, to amend the law prohibiting the possession of a hypodermic syringe, needle or any instrument adapted for the subcutaneous injection of narcotic drugs except by a physician, dentist, nurse, veterinarian or legitimate manufacturer or dealer, proposes to permit chiropodists or podiatrists also to possess such instruments.

Minnesota

Bill Introduced.—S. 1278 proposes to direct the director of social welfare to provide facilities at the state sanitarium for the treatment of tuberculous patients who refuse medical treatment or who do not abide by the rules and regulations of the state sanitarium or other county sanitarium when hospitalized or who otherwise wilfully expose others to tuberculosis.

New Jersey

Bills Introduced.—A. 404 proposes to consolidate and coordinate the public health activities of the state by creating a department of health to consist of a commissioner, a public health council and such divisions as the commissioner may establish. The functions usually performed by the state department of health, the state board of health, the state director of health or the Perth Amboy Port health officer and his deputy are to be transferred to the new department of health. The acceptance by the commissioner of federal grants for public health purposes is to be subject to approval by the governor of the state and the public health council. The bill provides for the coordination of the public health activities of the state with respect to (1) maternal and child health services; (2) dental health; (3) public health nursing; (4) industrial hygiene; (5) sanitary engineering facilities; and (6) laboratory analyses. The bill also proposes to authorize the commissioner to establish state health districts to facilitate the integration and coordination of local health activities. Committee Sub. for A. 381 and A. C. R. 16 propose to authorize the department of health to establish a suitable program to collect, process, store and distribute human blood and the various human blood derivatives including special therapeutic and diagnostic serums which are deemed of value in the treatment of sick and injured persons and the prevention of certain diseases.

Coming Medical Meetings

New Hampshire Medical Society, Manchester, May 15. Dr. Carleton R. Metcalf, 5 S. State St., Concord, Secretary.

Rhode Island Medical Society, Providence, May 16-17. Dr. William P. Buffum, 122 Waterman Street, Providence 3, Secretary.

South Dakota State Medical Association, Watertown, June 3-5. Dr. Roland G. Mayer, 22½ S. Main St., Aberdeen, Secretary.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

CALIFORNIA

Personal.—The sixtieth birthday of Carl L. A. Schmidt, Ph.D., professor and chairman of the department of biochemistry and dean of the college of pharmacy, University of California, Berkeley, was celebrated with a tea held on March 9. In honor of the occasion a portrait of Dr. Schmidt was unveiled, and he was presented with a bound volume of congratulatory letters from his students and associates. Dr. Schmidt retired from his administrative activities in the San Francisco campus in 1944 to devote full time to his work in Berkeley.

Mother's Milk Bank.—The Baby Hygiene Committee of the American Association of University Women is considering the establishment of a mother's milk bank in San Francisco. To determine whether such a project would fill the need in San Francisco, a group of 134 local physicians who might use such a facility were sent a letter asking opinions on the project. Of the 46 replies received, 40 felt that there was a need for a mother's milk bank in the city, 6 questioned the need and 3 of this 6 believed such a project unnecessary and unpractical at present. The *Bulletin* of the San Francisco County Medical Society, in reporting the project, stated that the agency through which such a facility would be developed remains to be determined; in any event a staff of interested physicians will be asked to serve in an advisory capacity in its operation. The Baby Hygiene Committee of the American Association of University Women is interested in the educational aspect of child welfare and, in the past, has pioneered several programs which are now being carried on by the child hygiene bureau of the San Francisco Department of Public Health, such as the well baby centers, supervision of private boarding homes for infants and children and cardiac diagnostic centers for school children.

CONNECTICUT

New Haven Hospital Sets Up Priorities on Patient Admissions.—A priority plan for the admission of private and semiprivate patients at New Haven Hospital, New Haven, became effective March 5. Under the plan, patients are admitted in the following order: emergencies immediately; then, if space is available, group I patients, consisting of those with such diagnoses as chronic lung abscess, severe ulcerative colitis, cancer, complicated patent ductus, subacute bacterial endocarditis, toxic thyroid or obstruction of respiration caused by thyroid, spinal cord tumor and therapeutic abortion; and, finally, if space is available, other patients in chronologic order. Waiting lists are kept separately for group I and other patients. If a patient twice refuses admission when called, he goes to the bottom of the list, according to *Modern Hospital*.

GEORGIA

Physician Wins Gold Medal for Work on Magnet.—Dr. Murdock S. Equen, Atlanta, has been awarded the 1944 gold medal of the Thomas A. Edison Foundation for his development of the Alnico magnet to remove metal objects from the stomach and lungs, newspapers announced March 30. Robert D. Hobday, Miami, Fla., president of the foundation, is reported to have said that Dr. Equen had been given the award for "outstanding contribution to the arts and sciences" through the development of the magnet.

ILLINOIS

Boards Named for New Health Departments.—Members of the boards of health who will be in command of the new health departments in Adams and DuPage counties were recently appointed by the respective county boards of supervisors. These two counties were the first in Illinois to establish their own full time health departments by popular vote, this action having been taken in the November 1944 election (THE JOURNAL, Dec. 9, 1944, p. 970). In compliance with the Searcy-Clabaugh law under which county health departments are established, the membership of each of these county boards of health, "chosen for their special fitness for membership on the board," includes two physicians, one dentist and four other persons. Members of the Adams County board of health include Drs. Walter D. Stevenson, Quincy, and Walter E. Davidson, Liberty, and for DuPage county Drs. Carl E. Schultz, Hinsdale, and Arthur S. Webb, Wheaton.

Chicago

Meeting of Bacteriologists.—The Society of Illinois Bacteriologists will be addressed at the Museum of Science and Industry, May 11, by Kenneth C. Robbins, Ph.D., on "Plasma Proteins and Their Relationship to Antibodies" and by J. M. Severens, Ph.D., Urbana, Ill., "Contributions of the Electron Microscope to Bacteriology."

Roosevelt Memorial for La Rabida.—A memorial bed for children at the La Rabida Jackson Park Sanitarium was made possible April 14 with the gift of $1,000 by Albert Pick Jr., Highland Park. The memorial will be named to honor Franklin Delano Roosevelt and his work in caring for stricken children. The sanitarium cares for children with rheumatic fever.

Medical Record Librarian Institute.—A five day institute will be held at the Knickerbocker Hotel, May 14-18, under the auspices of the American Hospital Association and the American Association of Medical Record Librarians and in cooperation with Northwestern University, the Chicago Hospital Council, the Illinois State Hospital Association and Chicago and vicinity medical record librarians.

Warren Cole Named Associate Dean at Illinois.—Dr. Warren H. Cole, professor and head of the department of surgery, University of Illinois College of Medicine, has been appointed to serve also as associate dean of the college of medicine. Dr. Cole, who has been with the University of Illinois since 1936, will in his new capacity assist Dr. Raymond B. Allen as dean of the college of medicine.

First Typhus Death in Nineteen Years.—The first death in Chicago from typhus in nineteen years was announced by the city department of health, April 17. The death had occurred on April 15. Newspapers reported that the man was stricken on March 26 while on vacation in Mexico and was brought to Chicago by airplane the following day and hospitalized. This was said to be the first report of the disease in Chicago since 1937.

Dr. Kretschmer Lectures.—Dr. Herman L. Kretschmer, President of the American Medical Association, addressed the house of delegates of the Tennessee State Medical Association, Nashville, April 8, on "Some Activities of the American Medical Association." The following day he addressed the students at Vanderbilt University School of Medicine on "Some Problems of the American Medical Association"; he also conducted a clinic on the prostate gland.

KENTUCKY

Personal.—Dr. Don M. Griswold, Albany, N. Y., consulting epidemiologist, New York State Department of Health, is substituting for Dr. Hugh R. Leavell, professor of public health and bacteriology at the University of Louisville School of Medicine, and is on leave of absence by courtesy of Dr. Edward S. Godfrey Jr., Albany, New York State commissioner of public health. Dr. Leavell is now in the regional headquarters of the United Nations Relief and Rehabilitation Administration in London.——Dr. Edwin W. Sigler, Henderson, has resigned as health officer of Henderson County, effective March 31, to enter private practice.——Dr. Clement V. Hiestand, Campbellsville, vice president of the Kentucky State Medical Association, has been elected mayor of Campbellsville.

LOUISIANA

Personal.—Dr. Robert H. Bryant, district superintendent of the Central Louisiana State Hospital, Pineville, has been appointed superintendent of the State Colony and Training School, Alexandria.——Dr. Aristide J. Comeaux, Lafayette, has resigned as director of the Lafayette Parish Health Unit, a position he held for eleven years.

Alfred Cohn Gives Stars and Bars Lecture.—Dr. Alfred E. Cohn, member emeritus of the Rockefeller Institute for Medical Research, New York, delivered the annual lecture of the Stars and Bars chapter of Alpha Omega Alpha, Tulane University of Louisiana School of Medicine, New Orleans, recently. Dr. Cohn discussed various maladies of the heart. The lecture was created last year (THE JOURNAL, Sept. 30, 1944, p. 309) and is given on the initiation of new members into the chapter. The initiates this year included Thomas Gus

Baffes, Rodney Clifton Jung, John Jacob Baehr Jr., William Donald Franklin, William Henry Blahd, Beverly Blood, Gerald N. Weiss, Gerald Sanders Berenson, Roy White Jr., George Warren Prather and Merrill Seymour Prows, all seniors, and Vann Shaw Taylor, Joseph Clement King and Raphael Leo Robbins, juniors.

MASSACHUSETTS

London Physician Gives Dunham Lectures.—Dr. Vincent B. Wigglesworth, director, Agricultural Research Council Unit of Insect Physiology, London School of Hygiene and Tropical Medicine, London, will deliver the Edward K. Dunham lectures at the Harvard Medical School, Boston, on "The Insect as a Medium for the Study of Physiology." Individual lectures will be "The Insect Cuticle as a Living System," May 7, "Hormones and the Regulation of Insect Growth," May 9, and "Integration in the Epidermis of Insects," May 11.

Henry Pollock Honored.—A testimonial luncheon and a check for $350 were recently given to Dr. and Mrs. Henry M. Pollock. The occasion marked the recent retirement of Dr. Pollock as superintendent of the Massachusetts Memorial Hospitals, Boston, after thirty years (THE JOURNAL, February 24, p. 471). Dr. James W. Manary, superintendent of Boston City Hospital, was toastmaster at the dinner and speakers included Dr. Donald C. Smelzer, Philadelphia, president of the American Hospital Association, Everett W. Jones, Chicago, technical adviser, the *Modern Hospital*, and Dr. Charles F. Wilinsky, superintendent, Beth Israel Hospital, Boston.

NEBRASKA

Accident to Physician.—Dr. Oscar E. Liston, Elmwood, was injured when an automobile in which he was taking a patient to the hospital for an operation collided with another at an icy intersection.

Case Conference on Psychosomatic Medicine.—A weekly case conference on psychosomatic medicine has been started for the senior students in the Creighton University School of Medicine, Omaha, under the direction of Dr. Ben Slutzky of the department of medicine. Suitable cases are selected from the medical clinic of the dispensary. A particular effort is made to secure patients who have no organic disease. The case is assigned to two students. The usual history, physical and laboratory examinations are carried out to eliminate or confirm the presence of organic disease. The patient is then referred to Dr. Robert J. Streitwiesser of the department of psychiatry. A thorough study is made of the patient's emotional status. A particular effort is made to ascertain the presence and cause of emotional factors and conflicts. The student in charge then makes several calls at the home of the patient, and, working under the instruction of Dr. Streitwiesser, endeavors to obtain the complete picture of the patient's background, particularly with regard to cultural environment, financial status and other factors which might be responsible for the production of anxiety states. When this and a social service study are completed the case is discussed at a conference at the medical school, the student in charge presenting the medical, psychologic and social aspects and the social service worker the details of their investigation. The medical and psychiatric aspects are discussed by Dr. Slutzky and Dr. Streitwiesser, the psychologic factors and psychometric studies by Mrs. C. W. Hamilton Jr. and, whenever possible, experimental work which may explain the establishment and progress of the patient's present condition by Dr. Charles M. Wilhelmj, dean of the school. After a diagnosis has been agreed on the therapeutic approach is discussed in detail.

NEW HAMPSHIRE

Annual Meeting.—The next annual meeting of the New Hampshire Medical Society will be held at the Hotel Carpenter, Manchester, May 15.

NEW JERSEY

Physician Chosen Outstanding Citizen.—Capt. Henry H. Kessler (MC) was honored at a luncheon given by the Newark Advertising Club April 11 and designated the city's outstanding citizen of 1944. Among the 850 persons who attended the luncheon was Rear Admiral William J. C. Agnew (MC). Captain Kessler, now in charge of amputation cases at the U. S. Naval Hospital, Mare Island, Calif., formerly served as director of the New Jersey Rehabilitation Clinic. A feature of the luncheon was a presentation to Captain Kessler of a citation of merit from the National Department of Disabled American Veterans.

NEW YORK

Changes in Licensure.—The license to practice medicine of Dr. Paul H. Lichtenstein, Forest Hills, was reinstated by the commissioner of education on February 13. The license to practice medicine of Dr. Charles Victor Dukoff, New York, was recently revoked.

New Director of Laboratories and Research.—Dr. Gilbert Dalldorf, for fifteen years director of laboratories at Grasslands Hospital, Valhalla, has resigned, effective April 15, to become director of the division of laboratories and research of the New York State Department of Health. He succeeds Dr. Augustus B. Wadsworth (THE JOURNAL, March 17, p. 664).

Hospital News.—A gift of $51,500 has been given to the building fund of the New Rochelle Hospital, New Rochelle, by two brothers, F. M. E. and Rudolph Jay Schaefer and their wives, all of Larchmont. The gift will be used to construct and equip a nursery in a seven story addition the hospital plans to build as a memorial to Larchmont men and women serving in the war.

Personal.—Dr. Arthur B. Van Loon, Albany, who was a member of the medical grievance committee of the University of the State of New York from 1926 until his retirement last year, was recently guest of honor at a dinner given by the committee in recognition of his service. Dr. Van Loon had served as secretary and president of the committee.——Dr. Nathaniel H. Ives, Mount Vernon, has been made an honorary life member of the board of Mount Vernon Hospital in recognition of fifty years' service to the hospital.

Cancer Teaching Day.—May 23 has been designated cancer teaching day in a cooperative program at the Arnot-Ogden Memorial Hospital, Elmira, by the Medical Society of the County of Chemung, the Sixth District Branch of the state medical society, the state medical society and the division of cancer control of the state department of health. Among the speakers will be:

Dr. Clyde L. Randall, Buffalo, Hormone Therapy and the Prevention of Gynecologic Malignancies.
Dr. Archie L. Dean, New York, Carcinoma of the Genitourinary Tract.
Dr. Cushman D. Haagensen, New York, Diagnosis and Treatment of Breast Cancer.

New York City

William Henry Welch Lectures.—Edwin J. Cohn, Ph.D., professor of biochemistry, Harvard Medical School, Boston, gave one of the William Henry Welch lectures at Mount Sinai Hospital, April 26, on "Separation, Concentration and Characterization of Blood Derivatives." The second lecture in the series will be delivered April 30 on "Natural Functions and Clinical Uses of Blood Derivatives."

Research in Psychosomatic Problems.—On May 11 the American Society for Research on Psychosomatic Problems will conduct a regional meeting to demonstrate to the general practitioner psychosomatic management of the patients with peptic ulcer. Dr. Carl A. L. Binger will serve as chairman of a discussion on brief psychotherapy and Dr. David P. Barr as chairman of a symposium in the afternoon on peptic ulcer.

Antirabies Quarantine Continues.—At a special meeting, April 13, the New York City Board of Health acted to continue the antirabies quarantine throughout the city until August 13, six months after the date when the last rabid dog was picked up. The board of health based its action on the fact that the focus of the disease continues to exist in the city. In announcing the decision of the board, Dr. Frank A. Calderone, acting commissioner of health, stated that "the action taken by the board of health last October 16 was the only possible scientifically valid means of controlling rabies in dogs." The continuance of the quarantine was taken in full cognizance of the decision of Supreme Court Justice Charles W. Froessel in Queens County, April 6, when he declared the existing quarantine unconstitutional. Dr. Calderone pointed out that before Justice Froessel's decision Supreme Court Justice Aaron J. Levy in New York County on March 5, passing on a similar case, upheld the constitutionality of the antirabies resolution of the board of health. The quarantine order required that any unleashed dog found on a highway must either be destroyed within forty-eight hours or placed in quarantine for six months at the owner's expense to determine whether the animal had rabies. The New York *Times* stated that at the board of health it was said that since the order went into effect about 7,500 dogs had been picked up under the leashing order and 7,000 destroyed. During the same period 20,300 dogs were rounded up for other causes with all but 100 destroyed. The New York *Herald Tribune* reported that on April 4 Governor Thomas E. Dewey had signed a bill permitting the seizure,

confinement or killing of muzzled as well as unmuzzled dogs that are allowed to run at large in rabies infected areas and empowers the state health commissioner to designate rabies infected areas under conditions which he may prescribe and in which he may permit dogs that have been actively immunized against rabies to be at large.

NORTH CAROLINA

Physician Named for Work in Philippines.—Dr. John D. Bigger, Swannanoa, formerly a missionary to Korea, has been appointed director of medical work in the Philippines for all interdenominational agencies, according to the Asheville *Citizen-Times*, March 25, which reported also that the appointment was made by the Committee for Relief in Asia of the Federal Council of the Churches of Christ in America. It was stated that Dr. Bigger's task is to reestablish medical missions in several of the Philippine Islands as rapidly as possible. Dr. Bigger has been asked to be prepared to sail for Manila any time after May 1.

Personal.—Dr. Lenox D. Baker, associate professor of surgery in charge of orthopedics at the Duke University School of Medicine, Durham, has been elected president of the North Carolina League for Crippled Children.—Dr. Wayland N. McKenzie, health officer of Stanly County since July 1937, recently resigned to enter the private practice of medicine in Albemarle. Dr. Millard B. Bethel, Concord, holding a similar position in Cabarrus County, will serve in Stanly County on a part time basis:—Dr. Frank P. Hunter, Warrenton, has been chosen health officer of Warren County.—Dr. John R. Saunders, for two years superintendent of the State Hospital at Morgantown, has resigned, effective about May 1.

PENNSYLVANIA

Special Society Election.—At a meeting of the Reading Eye, Ear, Nose and Throat Society, March 21, in Reading the following officers were elected: Drs. Isaac B. High, president; Claude W. Bankes and Michael J. Penta, vice presidents; Paul C. Craig, secretary, and John M. Wotring, treasurer. The society was addressed at the meeting by Dr. George M. Coates, Philadelphia, on "Osteitis and Osteomyelitis of the Frontal Bone."

State Society Plans Insurance Program.—On April 14 Dr. Chauncey L. Palmer, Pittsburgh, president of the Medical Service Association of Pennsylvania, announced that the organization, with the approval of forty-five county medical societies, was ready to launch a statewide program to make low cost medical insurance available to "every man, woman and child in this commonwealth." At the time 2,000 physicians, 425 from Philadelphia, were enrolled in the plan. The announcement indicated that the group tried unsuccessfully to develop a cooperative statewide program with Blue Cross but that the cooperation of the latter group was not forthcoming. It was stated that the Medical Service Association of Pennsylvania deplored the controversy that has raged around proposed legislation by which Blue Cross "seeks to invade the field of private medicine for its own selfish ends."

SOUTH DAKOTA

Personal.—Dr. Daniel S. Baughman, Madison, has been appointed superintendent of the Lake County Board of Health, succeeding Dr. Clarence E. Sherwood, Madison, city health officer and member of the state board of health.

Dr. Waller Goes to Georgia.—William H. Waller, Ph.D., professor of anatomy, University of South Dakota School of Medical Sciences, Vermillion, recently accepted a position as associate professor of gross anatomy at the University of Georgia School of Medicine, Augusta.

TEXAS

Changes in Health Personnel.—Dr. Frederick R. Lummis, Houston, was recently named chairman of the Houston Board of Health, succeeding Dr. Everett L. Goar, who resigned to devote more time to his activities as professor of ophthalmology at the Baylor University College of Medicine, Houston. The following have recently been placed in charge of the health units designated:

Dr. Wyly H. Harris, Raymondville, of Willacy County.
Dr. Gus N. Lancaster, Granbury, of Hood County.
Dr. Byron L. Jordon, Daisetta, reappointed, of Liberty County.
Dr. Clifford G. Swift, Cameron, Milam County.
Dr. Sam J. R. Aronson, Amarillo, Potter County.

Fellowship Named for Dr. Graves.—A research fellowship in internal medicine will be established at the University of Texas Medical Branch, Galveston, in honor of Dr. Marvin Lee Graves, emeritus professor of internal medicine. Funds to create the new fellowship were given to the medical school by Dr. Edwin Ghent Graves, Mrs. George T. Morse and Mrs. Laura Lee Graves Steel, Houston, in honor of their father. The fellowship will be filled annually by the department of medicine through the appointment of a graduate in medicine who is considered most likely to maintain the professional standards and ideals of Dr. Graves.

Graduate Medical Training Established.—The creation of a postgraduate medical training program under the direction of Dr. George M. Decherd Jr., associate professor of internal medicine, University of Texas Medical Branch, Galveston, has been announced. A special faculty committee will cooperate with Dr. Decherd in the development of a broad postgraduate medical training program, which will embody three features: short postgraduate conferences and courses on special subjects, to be held at the medical branch, two day conferences to be given by members of the medical branch faculty in cooperation with county and district medical societies in various parts of this state, and residency training for specialty board certification and specialty practice. Emphasis in residency training will be placed on preclinical laboratory work in the special fields in which the resident is interested. The preclinical laboratories of the medical branch will cooperate with hospitals approved for residency training in Texas in affording appropriate facilities for fundamental training in specialties. The first conference to be held under the auspices of the new postgraduate training program is being arranged by the department of pediatrics and the child health program, under Dr. Arild E. Hansen, professor of pediatrics, for May 14-19 (THE JOURNAL, April 14, p. 1003). Forty physicians can be accommodated for the period.

VIRGINIA

Dr. Van Slyke Gives Alpha Omega Alpha Lecture.—The annual lectureship of the Brown-Séquard chapter of the Alpha Omega Alpha is to be given May 4 in the Simon Baruch Auditorium of the Egyptian Building at the Medical College of Virginia, Richmond, by Dr. Donald D. Van Slyke, chief research chemist at the Hospital of the Rockefeller Institute for Medical Research, New York. His subject will be "The Physiology of the Kidney."

Dr. Buerki Conducts Hospital Study in Richmond.—Dr. Robin C. Buerki, dean of the Graduate School of Medicine and director of hospitals, University of Pennsylvania, Philadelphia, will carry on a survey under the auspices of the Richmond Community Council of hospital facilities in Richmond, according to the Richmond *Times-Dispatch* of March 22. The study, which was to begin April 14, is the result of a citywide demand last November for a survey of present and future needs of hospital facilities. At the recommendation of William T. Sangar, Ph.D., president of the Medical College of Virginia, the Richmond Community Council was selected as the agency to make the study.

WEST VIRGINIA

County Society Launches Prepayment Insurance Plan.—A prepayment medical insurance plan covering surgical and obstetric fees was approved by the Ohio County Medical Society at a recent meeting held in Wheeling. The plan will give full coverage to the low income group and will operate on an indemnity basis for those with higher incomes. The board of directors will be composed of six physicians and three laymen. The society has appointed the following physicians to serve as members of the board: Drs. William P. Sammons, Howard T. Phillips, Earl S. Phillips, Edward S. Bippus, Samuel W. Tretheway and Delivan A. MacGregor, all of Wheeling.

George Evans Named as Superintendent of New Memorial Home.—Dr. George P. Evans, Jaeger, will become the first superintendent of the new Andrew S. Rowan Memorial Home at Old Sweet Springs. The appointment, announced by Governor Clarence W. Meadows, is effective July 1, the date for the opening of the institution for the care of aged and infirm white men and women. Old Sweet Springs, popular Monroe County resort built prior to the Civil War, was purchased by the state in 1941 for use as a tuberculosis sanatorium. No appropriation was made for the purpose by the 1943 legislature, and the buildings have not been in use for about two years. The property is now being thoroughly renovated and improved to provide adequate facilities for use as a home for aged men and women now being cared for principally in state mental institutions. The bill (S. B. 9) establishing the home, passed at the recent session of the legislature, also provides that the institution may be used as a rehabilitation center for some of the boys sentenced to the state reformatory at Pruntytown. Dr. Evans graduated at the College of Physicians and Surgeons, Baltimore, in 1908.

GENERAL

Therapeutic Meeting Canceled.—The American Therapeutic Society has canceled its meeting scheduled to be held June 15 in Atlantic City, N. J.

William Bowen Named Executive Assistant of Paralysis Foundation.—William C. Bowen, East Orange, N. J., formerly regional director in the New England states for the American Red Cross, has been appointed executive assistant to Basil O'Connor, president of the National Foundation for Infantile Paralysis. The appointment to the newly created position is effective immediately and carries with it the chairmanship of the administrative committee of the National Foundation.

International Conference of Arts, Sciences and Professions.—The Independent Citizens' Committee of the Arts, Sciences and Professions is initiating an international conference to which leaders of the three groups in the principal United Nations will be invited. The announcement followed a recent meeting in New York in which leaders of more than twenty-five American professional associations participated. Among those in attendance at the recent meeting included Robert Chambers, Ph.D., president of the Union of Biological Sciences, Alonzo F. Myers, Ph.D., and Dr. Frank Fremont-Smith, all of New York, and Helen Keller, Westport, Conn.

Sigma Xi Lectures on the Blood.—Michael Heidelberger, Ph.D., associate professor of biochemistry, Columbia University College of Physicians and Surgeons, New York, opened a series of lectures on the blood under the auspices of Sigma Xi April 27 at the University of Vermont, Burlington. The lecture will be given at the following places to complete the schedule: Oberlin, Ohio, April 30; Minneapolis, May 2; Columbia, Mo., May 4; Boulder, Colo., May 7; University of California, Los Angeles, May 11; Stanford University, Palo Alto, Calif., May 14; Shell Development Research Club, Emeryville, Calif., May 15; Abbott Laboratory Research Club, North Chicago, Ill., May 21; Illinois Institute of Technology, Chicago, May 22, and the University of Pennsylvania, Philadelphia, May 23.

Cancer Society Reorganized.—On April 4 the American Cancer Society announced the general reorganization of its "Structure and Orientation" designed to provide a firm basis and expert direction in the expenditure of the five million dollars being sought in its current campaign. The reorganization comprises four major steps: election of prominent laymen to a majority of the board of directors to manage the funds of the society; creation of a board of medical men and scientists in the field of cancer to direct professional and scientific plans; cooperation with the National Research Council in the formulation of a long-term cancer research program involving recommendations of specific research projects, and authorization of a nationwide survey to establish the need for service to cancer patients in the light of the war and future conditions. In a statement to the press, Dr. Frank E. Adair, New York, president of the American Cancer Society, stated that a majority of the medical and scientific leaders on the board of directors had resigned to make way for new lay members and that the former had been reconstituted into a special board which will have control in all matters in the scientific and medical fields. Eric A. Johnston is chairman of the society's campaign to raise five million dollars (THE JOURNAL, Dec. 30, 1944, p. 1160).

Examinations in Internal Medicine.—The American Board of Internal Medicine announces that the closing date is May 5 for persons to take the oral examination in Philadelphia, June 6-8; this applies to persons residing in Maine, Connecticut, Vermont, Maryland, New Hampshire, New York, Massachusetts, West Virginia, Delaware, New Jersey, Rhode Island, North Carolina, Virginia, South Carolina, Pennsylvania and the District of Columbia. May 5 will be the closing date for the oral examination in New Orleans, May 21-23, for persons living in Tennessee, Mississippi, Texas, Arkansas, Georgia, Louisiana, Alabama, Oklahoma and Florida. May 12 will be the closing date for the oral examination in Chicago, June 27-29, for persons living in North and South Dakota, Iowa, Indiana, Illinois, Kansas, Minnesota, Michigan, Nebraska, Kentucky, Wisconsin, Missouri and Ohio. September 1 will be the closing date for the oral examination in San Francisco, October 15-17, for persons residing in Montana, New Mexico, Arizona, Oregon, Wyoming, Idaho, Nevada, California, Colorado, Utah and Washington. Candidates who have been notified of the approval of their application for admission to an oral examination in a subspecialty will be admitted at the time and place of the oral examination in internal medicine, provided the oral examination in internal medicine is satisfactory. Candidates with an A. P. O. address who find it possible to report, please advise the board as to the most convenient place on the schedule. The schedule must of necessity be fixed within geographic limits but will be sufficiently flexible to accommodate candidates in the armed forces if they have a change of station after the closing date for the acceptance of applications. Candidates previously certified in internal medicine will be admitted to oral examination in their subspecialty in accordance with the schedule if application has been approved and notification has been received. All communications should be addressed to Dr. William A. Werrell, assistant secretary-treasurer, American Board of Internal Medicine, 1301 University Avenue, Madison 5, Wis.

Radiologists Not Subject to Sales Tax.—The American College of Radiology has filed a brief contesting a ruling of the California Board of Equalization, April 7, that physicians engaged in the specialty of radiology should be subject to the payment of a state sales tax on films used. The ruling is similar to one issued by the deputy comptroller for the department of finance in New York City recently which attempted to classify radiologists as subject to the sales tax by assuming that they were engaged in the sale of merchandise when examining patients with the aid of the x-rays. A brief filed by the counsel of the American College of Radiology in protest to the ruling pointed out that radiologists made examinations of patients, in making diagnoses, but did not "furnish the same to such persons." The brief also called attention to the fact that the prevailing weight of judicial opinion held that roentgenograms were the legal property of the radiologist and that patients had no right of possession to them. Subsequent action resulted in an announcement that the ruling would not be applied to licensed physicians practicing radiology. In the New York action the following was presented as the ruling of the deputy comptroller to justify his order:

> Persons operating x-ray laboratories who, upon instructions from physicians and others, take radiographs or x-ray plates of persons and furnish the same to such persons and may in addition thereto render written reports on the disclosures made by such plates, are deemed to be engaged in the sale of tangible personal property at retail to such persons. Such laboratories are not deemed to be engaged in rendering professional services, notwithstanding the fact that they are licensed by the city department of health and that, under the regulations of such department, the laboratory must at all times be in charge and under the direction of a duly licensed physician or other person licensed under the laws of the state of New York to diagnose and treat diseases. Such laboratories, even though they employ a licensed physician specializing in roentgenology who may render a written report on the disclosures made by the x-ray plate, are engaged primarily to take radiographs or x-ray pictures and not to diagnose disease. As such, they are deemed to be venders of tangible personal property at retail and must charge and collect sales tax on the price of the plate.

CORRECTION

Abdominal Pain in Children.—The word "sphincter" should read "stricture" in the second last line of the closing discussion by Dr. Brennemann in THE JOURNAL, March 24, page 695.

Government Services

New Director of Health in Indian Affairs Office

Dr. John R. McGibony, Chicago, director of health, U. S. Office of Indian Affairs, was transferred on April 15 to the hospital facilities section of the U. S. Public Health Service, Washington, D. C., of which Dr. Vane M. Hoge is director. He will be succeeded by Dr. Ralph B. Snavely, U. S. Public Health Service, whose recent assignment was district medical director of the Indian Service in San Francisco and Albuquerque, N. M.

Triptych Symbolizing Healing at Medical Center

The Colonial Dames Society has presented to the Naval Medical Center, Bethesda, a triptych symbolizing the healing by Jesus of the impotent man at the Well of Bethesda. The presentation was made to Rear Admiral William Chambers (MC) by Mrs. Barron P. Du Bois, president of the Colonial Dames, who said that she hoped the painting, executed by Violet Oakley, American artist, would be an inspiration to members of the staff of the center as well "as give hope to all ill here that they, like the helpless man of biblical Bethesda, may take up their beds and walk."

Foreign Letters

LONDON

(From Our Regular Correspondent)

March 24, 1945.

Greatly Improved Results of War Surgery

In no previous war has surgery been so efficient. Surgical treatment is now available so near the field of battle and in such thorough fashion that when a British soldier is wounded, however seriously, he has more than a 9 to 1 chance of survival if picked up quickly. On the western front since D day about 40,000 major surgical operations have been performed in forward areas, in addition to the vast number in the great base hospitals. The high degree of success in the forward operations is due largely to improvements in both preoperative and postoperative treatment. The former includes transfusion of blood, plasma or serum. In the war of 1914-1918 if a man received a pint of blood before an operation at a base hospital that was thought to be good. Now a wounded man can have any quantity of blood or other fluid that is necessary transfused in a field surgical unit.

On the postoperative side there have been developments beyond anything known even earlier in this war, and the most important has been the going forward of the nursing sisters. To a man fresh from an operation after a bad wound, the sight of a woman at his bedside is deeply comforting and there are nurses who have lived for long spells in shelled areas to give this comfort. Other things available at the front which count are proper beds and bedclothes and invalid foods.

Penicillin is now taking the place of the sulfonamides, which were so much relied on earlier in the war, and the growth of knowledge of its uses has been immense.

The bugbear of war surgery is sepsis, particularly in the Middle East. On the western front wounds have been cleaner and therefore less dangerous. As to chances of recovery from the more severe wounds, it is now considered unsatisfactory if no more than 2 in 3 recover from penetrating abdominal wounds, whereas in the last war only 1 in 3 recovered. In chest wounds and even in head wounds affecting the brain 9 out of 10 who reach the surgery living survive. Far fewer amputations are necessary than in the other war, and almost invariably only one operation is needed. Of the amputated men 95 per cent survive. Gas gangrene is rarely seen and tetanus not at all, though both were a plague for the wounded a quarter of a century ago. Trench feet are seen only in enemy prisoners. In the base hospitals minor wounds heal at astonishing speed, and the death rate is under 0.5 per cent. Of the first 50,000 wounded sent from Normandy to England last year only 0.4 per cent died.

Educational Provision for Patients in Hospitals and Sanatoriums

A new provision for the benefit of patients in hospitals is being made. The minister of health has had under consideration, in consultation with the minister of education, the question of enabling civilian patients likely to be detained in hospitals or sanatoriums for long periods to pursue educational courses if they so desire and if suitable arrangements can be made. There is ample evidence that, in addition to its educational value, a course of study or craft work, whether general or vocational, in which the patient is interested, can help to accelerate recovery and remove that sense of frustration which prolonged enforced inactivity may entail. The minister of education has therefore asked the local authorities for higher education to do their best to provide such facilities where needed.

In a circular to the local authorities the minister of health asks them when satisfied, on the advice of the medical officer in charge of the case, that a patient should be encouraged to pursue a course of study, having regard to the likely effect on the patient's condition, to put the patient in touch with the chief education officer in the area. In applying for a course the patient should state how much of the subject he knows and what examination or purpose he has in mind, so that the officer can decide whether a beginner's or more advanced course is required. A correspondence course will often be the only one practicable in the circumstances, but the tutor may wish to visit the patient for the purpose of correcting exercises. For this the hospital authorities should grant facilities. In the provision of textbooks the local education authority may be able to help. While it would generally be inappropriate to charge the patient more than a small fee, it is thought that unless some fee is charged there may be a risk of courses being started too readily and dropped owing to waning interest. A fee, ranging from $1 for shorter courses to $2 for longer, would generally be appropriate. The War Office already has correspondence courses for members of the fighting forces detained in the hospital. Other educational methods may be used. Thus arrangements may be made for a number of patients suffering from injuries who have reached an ambulant stage to attend a practical course at a nearby technical institute or art school. There is also the possibility of providing for small groups of patients by means of discussion circles and informal lectures.

The Protective Power of Vaccination Against Smallpox

In the House of Commons Sir James Grigg, in reply to a question, stated the present official view of the protective value of vaccination against smallpox. He said that 100 per cent protection had never been claimed. The maximum degree of immunity was estimated to develop about fourteen days after vaccination; thereafter it gradually waned, but it remained effective, under normal conditions, for five years in Britain and for three years in Egypt, where the risk of infection was somewhat greater. During an epidemic the virulence of the infecting agent was such that even the maximum degree of immunity conferred by immediate vaccination was not in every individual case sufficient to resist the disease. Nevertheless experience had shown that the revaccination of all exposed to infection, coupled with the normal precautions of immediate isolation of infected persons and restriction of movement of possible contacts, was successful in giving immunity to all but a small proportion and in quelling an epidemic.

Native African Physicians

Laying the foundation stone of the Douglas Smut residence for African students at the Witwatersrand University, the minister of native affairs said that if the European section was sincere in its promises when the 1936 legislation was before parliament the native must be actively encouraged and assisted to supply the services his people required in their own territories. When it had been shown that a section of the African community had the ability to become fully qualified physicians, every facility should be placed at their disposal. There were 24 African students studying medicine. He was glad that the Johannesburg hospital board was to provide housemanships for non-European graduates.

The Army Doctor Who Went Down with His Ship

The George Cross has been posthumously awarded to Capt. J. R. O. Thompson of the Royal Army Medical Corps for conspicuous gallantry and devotion to duty on board hospital ships, which, in disregard of the Geneva Convention, were repeatedly attacked by the Germans. Under dive bombing and

shell fire he showed indifference to danger and physical exhaustion in the care of his patients. At Anzio on Jan. 24, 1944, when the *St. David* was sinking rapidly as the result of a direct bomb hit, he organized parties to carry the seriously wounded to safety in the boats and was thus instrumental in saving many lives. When the ship was obviously about to founder and all were ordered to save themselves, he returned alone in a last effort to save the one remaining helpless patient still lying trapped below. It is presumed that he went down with his ship.

PALESTINE

(From a Special Correspondent)

JERUSALEM, March 1, 1945.

Nutritional Economic Survey of Wartime Palestine, 1942-1943

A report just issued by Dr. Vickers on behalf of the Department of Health, Government of Palestine, attempts a survey on nutritional conditions in Palestine during the years 1942-1943. The procedure was to establish the quantities of foodstuffs consumed by 1,370 families and 1,390 persons living in four communal settlements during a period of from three to seven days. Each family or settlement was visited by a welfare nurse during that particular period. She worked under the direction of a physician, and the final checkup was made by Dr. Vickers himself. The results thus obtained were applied to the 1½ million inhabitants of Palestine. As a criterion for a comparison of nutritional conditions the author chose a food expenditure unit (amount of money spent on food per capita monthly), on the basis of which he constructed eight economic categories, the group interval not exceeding 0.250 Palestinian pound. Before embarking on a comparison of data for 1942 with those for 1943 one should bear in mind that during that period the cost of living index had risen from 175 in January 1942 to 248 in June 1943. Moreover, the introduction of food rationing in certain areas of Palestine, particularly in towns, by a points system, caused a shortage of certain food articles, which naturally found its reflection in family budgets.

The main conclusion Vickers drew from the data obtained was that the nutritional condition of the Palestine population had improved in the period 1942-1943, indeed, that in 1943 it was better than ever before judging from the increased expenditure on food. However, he neglected the fact that actually in the lower classes nutrition is far from being adequate and that in the middle classes too a lack of animal protein, calcium and vitamin A makes itself felt. In his own words this means "that food expenditure has rapidly risen over the period and that a majority of the poor have now gone into what would have been classed as the medium expenditure groups. The further corollary is also clear, however, that nutrition has improved since 1942. While a good deal more was being spent on food in 1943 than possibly at any other period in the country's history, it would appear that a good many more are receiving a better diet. It follows of course that that proportion which is still really undernourished, also a considerably reduced section, is worse off than before. Possibly some 75 per cent (375,000) of the population of the three large urban areas under review now comes into the two upper groups instead of only 25 per cent a year ago. . . ."

The objections aroused by this report in various quarters mainly concerned the fact that the basis on which it was constructed is too narrow and cannot therefore truly reflect the situation. His conclusion that in 1942-1943 30 per cent of the urban population spent more than £P.2.500 per capita per month is based "on careful consideration of various factors, including observation." Of the practical suggestions made by the author, those referring to rationalization of household work and instruction of housewives deserve a wholehearted support. He also demands the introduction of cooking as a subject in girls' schools and emphasizes the necessity of adding vitamins A and D to the food of children as well as the addition of calcium to our bread. A wider use of vegetable fats is urged, an expansion of the school feeding scheme and an extension of the Palestine restaurant system and factory canteens.

Malaria Problems

The December 1944 meeting of the Jewish Medical Association in Jersualem was devoted to the problem of malaria. Dr. Aschner enumerated the various anopheles species of Palestine and the specific life habits of these transmitters and discussed the control measures successfully employed in Palestine. He stressed the great difficulties with which antimalarial field work is attended in Palestine owing to the great diversity of the population; e. g., the drainage of swamps on Jewish soil, financed by private means, is frustrated if the swamps are surrounded by Arab settlements with an inimical attitude toward the drainage scheme. He then gave a short survey of the work of the late Professor Kligler in this field, specially mentioning his studies on the flying range of the various anopheles species which he deemed as of fundamental epidemiologic significance. In memory of Professor Kligler a Central Malaria Research Institute is to be erected in the Huleh region, the only area still exposed to an important degree to malaria.

Professor Adler in his lecture took up the question of treatment. Quinine, which was introduced into the therapy of this disease about three hundred years ago, has in his opinion saved the greatest number of human lives ever rescued by a therapeutic agent. He recommended giving 2 Gm. per day for the duration of five or six days and then to continue for two months with the same dose on two days of the week. Unfortunately quinine is no therapia magna sterilisans either. He reported 2 interesting cases he saw himself, in 1 of which after blood transfusion the recipient developed malaria, while the donor had had his last attack twenty years ago, and the other in which after blood transfusion the donor had a malarial attack after a period of latency of eight years. The plasmodia, once acquired, cannot therefore ever be got rid of, a fact on which the amount of quinine administered has no bearing. Adler gave an account of a case in which after continuous treatment with a total of 90 Gm. of quinine relapse occurred two days after the treatment had been discontinued. Atabrine has proved equal to quinine and shows the same favorable effect on schizonts as quinine. In conclusion, Adler stressed the great importance of the laboratory search for plasmodia, since "there is no clinical diagnosis of malaria."

Marriages

JAMES NEAL BRIEN JR., Washington, D. C., to Miss Adah Maud Hamblen of Chattanooga, Tenn., March 24.

RAYMOND WILLIAM NEMECEK to Miss Rosemary Ann Hamilton, both of Chicago, March 14.

RAYMOND N. NELSON, Elkhorn, Wis., to Miss Carolyn J. Gilden of Whitewater, March 21.

CARROLL R. OLSON, Milwaukee, to Miss Thelma Olson of Burgettstown, Pa., December 22.

JESSE HALL COLLEY, Troy, Ala., to Mrs. Virginia Lee Reid of Dallas, Texas, February 24.

MAX ROSSMAN, Allentown, Pa., to Miss Rose Markley of Homestead, Pa., March 8.

MAX BENDERSKY to Miss Dorothy Fryburg, both of Amityville, N. Y., Oct. 22, 1944.

WILLIAM KEMP WRIGHT to Miss Mary Ruth Brown, both of St. Louis, February 10.

NORBERT A. KLUCIKOWSKI to Miss Virginia Turner, both of Chicago, January 27.

Deaths

Henry Irwin Klopp, Allentown, Pa.; Hahnemann Medical College of Philadelphia, 1894; member of the National Committee for Mental Hygiene, American Psychiatric Association and the American Orthopsychiatric Association; served as president of the Pennsylvania Psychiatric Society and the Pennsylvania State Homeopathic Medical Society; fellow of the American College of Physicians; specialist certified by the American Board of Psychiatry and Neurology, Inc.; professor of psychiatry at his alma mater; in October 1937 his portrait, the gift of the medical societies of Lehigh, Northampton and Bucks counties and the Lehigh Valley Homeopathic Society, was unveiled, commemorating the twenty-fifth anniversary of the Allentown State Hospital, which he had served since its inception and from which he retired July 1, 1942; at one time assistant physician and assistant superintendent of the Westboro State Hospital, Westboro, Mass.; active on the boards of the Community Chest, the Association for the Blind of Northampton County and the Lehigh Valley Child Guidance Clinic, which he helped to found; died in the Hahnemann Hospital, Philadelphia, March 7, aged 75, of tumor of the thorax.

John Charles Vincent Fisher ✠ Boston; Boston University School of Medicine, 1917; associate professor of obstetrics at his alma mater; member of the New England Obstetrical and Gynecological Society; past president of the Norfolk District Medical Society and the West Roxbury Medical Society; interned at St. Elizabeth's Hospital, where he served on the associate staff; visiting obstetrician at the Massachusetts Memorial Hospitals; on the associate staff of the Faulkner Hospital; a surgeon for the U. S. Merchant Marine during World War I; medical examiner for the draft board of West Roxbury; associate editor of the *Norfolk Medical News;* died February 19, aged 53, of coronary thrombosis.

William Jephtha Calvert, Englewood, N. J.; Johns Hopkins University School of Medicine, Baltimore, 1898; interned at the Johns Hopkins Hospital, 1898-1899; first lieutenant and assistant surgeon in the U. S. Army in 1902 and first lieutenant and assistant surgeon, reserve medical corps, U. S. Army, 1909; at one time assistant professor of internal medicine, professor of physical diagnosis and clinical pathology and professor of preventive medicine at the University of Missouri School of Medicine, Columbia; served on the faculty of the Baylor University College of Medicine, Dallas, Texas; died in Daytona Beach, Fla., March 21, aged 73, of chronic interstitial nephritis and arteriosclerosis.

Sigmund Arthur Agatston ✠ New York; Columbia University College of Physicians and Surgeons, New York, 1900; specialist certified by the American Board of Ophthalmology; fellow of the American College of Surgeons; formerly assistant clinical professor of ophthalmology at the New York University College of Medicine; on the staffs of the Sydenham Hospital, New York Eye and Ear Infirmary and the Montefiore Hospital; died March 5, aged 68, of heart disease.

William Aloysius Behan ✠ Binghamton, N. Y.; University and Bellevue Hospital Medical College, New York, 1910; fellow of the American College of Surgeons; served during World War I; member of Selective Service Board No. 449, 1943-1944; co-chairman surgical staff, City Hospital, consulting surgeon, Broome County Tuberculosis Hospital, Chenango Bridge; on the staff of Our Lady of Lourdes Memorial Hospital, where he died February 24, aged 66, of coronary thrombosis.

Robert Kemp Brewer ✠ Syracuse, N. Y.; Syracuse University College of Medicine, 1913; professor of physiologic chemistry at his alma mater; consulting chemist in Syracuse University Medical Center Hospitals; died March 22, aged 58, of coronary thrombosis.

Michael Jeremiah Josephus Coluccy, Madison, Wis.; New York Medical College and Flower Hospital, New York, 1916; member of the American Medical Association; served during World War I; member of the local board of health; on the staffs of the Madison General Hospital and St. Mary's Hospital, where he died February 28, aged 53, of cerebral hemorrhage and injuries received in a fall.

Thomas Wilson Deachman, Chicago; the Hahnemann Medical College and Hospital, Chicago, 1895; died in the Jackson Park Hospital March 25, aged 76, of cerebral hemorrhage.

William Hayden Dean, Bellevue, Wash.; Starling Medical College, Columbus, 1894; died December 30, aged 83, of carcinoma of the face.

James Lee English, Pittston, Pa.; Georgetown University School of Medicine, Washington, D. C., 1927; member of the American Medical Association; interned at the Wilkes-Barre General Hospital, Wilkes-Barre; served as medical examiner for the city public schools; commissioned a captain in the medical corps, Army of the United States, on Aug. 15, 1942; relieved from active duty on March 28, 1943; on the staff of the Pittston Hospital, where he died January 17, aged 43, of gastric hemorrhage due to cirrhosis of the liver.

John Matthew Flannery ✠ Buffalo; University of Buffalo School of Medicine, 1905; served during World War I; chief of staff of St. Francis Hospital, where he died March 14, aged 65, of carcinoma of the rectum.

Merton Louis Ford, Oneonta, N. Y.; University of the City of New York Medical Department, New York, 1886; formerly a druggist; a charter director of the Aurelia Osborn Fox Memorial Hospital; died in the Huntington Memorial Hospital, Pasadena, Calif., March 10, aged 84, of fractured neck of the right femur incurred in a fall.

Lucy Woodward Gardner, San Antonio, Texas; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1892; died February 22, aged 76, of abdominal carcinoma.

Robert Alonzo Hamilton, Hillsboro, Ill.; Beaumont Hospital Medical College, St. Louis, 1901; St. Louis College of Physicians and Surgeons, 1904; member of the American Medical Association; served during World War I; county physician; died February 21, aged 77, of myocarditis.

George Lightner Harrell ✠ Vero Beach, Fla.; Georgia College of Eclectic Medicine and Surgery, Atlanta, 1912; formerly a member of the state legislature; died in a hospital in Miami March 4, aged 60, of heart disease.

Thomas Ignatius Kealy, Philadelphia; Atlantic Medical College, Baltimore, 1908; died in the Fitzgerald Mercy Hospital, Darby, Pa., January 31, aged 63, of carcinoma of the liver.

James Albert Lynch, Cresson, Pa.; Medico-Chirurgical College of Philadelphia, 1896; member of the American Medical Association; served in France during World War I; past president of the Cambria County Medical Society; served a four year term as burgess of the borough and for more than thirty years secretary of the board of health and health adviser in Cresson; died February 11, aged 74, of injuries received when he accidentally fell from a window.

William Arthur McConkey ✠ Canton, Ohio; University of Wooster Medical Department, Cleveland, 1900; past president of the Stark County Medical Society; on the staffs of the Aultman and Mercy hospitals; died March 17, aged 74, of uremia.

Fergus Olamh Mahony ✠ El Dorado, Ark.; Medical Department of Tulane University of Louisiana, New Orleans, 1908; specialist certified by the American Board of Internal Medicine; fellow of the American College of Physicians; served in various offices of the Union County Medical Society; past president of the Arkansas Medical Society and for one term councilor of the Fifth District; city and county health officer; served as president of the state board of health; chief of the staff of Warner Brown Hospital; died February 6, aged 65.

Lucius Julius Mason, St. Petersburg, Fla.; Columbia University College of Physicians and Surgeons, New York, 1900; died February 10, aged 73, of cardiorenal disease.

Will H. Mathews, Nicholasville, Ky.; Hospital College of Medicine, Louisville, 1883; died in a hospital at Lexington February 3, aged 88, of senility.

Ludwig Michaelis ✠ Queens Village, N. Y.; Albertus-Universität Medizinische Fakultät, Königsberg, Prussia, 1920; on the staff of the Queens General Hospital, Jamaica; died in the Mount Sinai Hospital, New York, February 26, aged 50, of pericarditis.

Mark Millikin ✠ Hamilton, Ohio; Miami Medical College, Cincinnati, 1892; served as president of the Union District Medical Society; formerly health officer; in May 1942 was guest of honor at a dinner and presented with a gold watch by the Butler County Medical Society to observe his completion of fifty years in the practice of medicine; fellow of the American College of Surgeons; for twelve years councilman; member of the staffs of the Mercy and Fort Hamilton hospitals; died February 19, aged 76, of injuries received in a fall.

Rocco A. Nigro, Chicago; University of Illinois College of Medicine, Chicago, 1916; member of the American Medical Association; a member of the staff of the Mother Cabrini Hospital; died March 10, aged 50, of coronary thrombosis and mitral regurgitation.

August Wilhelm Oestmann, Jersey City, N. J.; Universität Leipzig Medizinische Fakultät, Leipzig, Saxony, 1891; member of the American Medical Association; died February 18, aged 77, of arteriosclerosis.

William Henry O'Neil, Ansonia, Conn.; Baltimore Medical College, 1911; member of the American Medical Association; interned at St. Mary's Hospital in Waterbury; school physician and surgeon of the Ansonia fire department; for many years health officer of Ansonia; served as president of the staff of the Griffin Hospital, Derby, where he died February 12, aged 61, of cardiorenal vascular disease.

Walter Rowley Paddock, Lockport, Ill.; Northwestern University Medical School, Chicago, 1896; for many years health officer; served on the staffs of the Silver Cross and St. Joseph's hospitals, Joliet; died January 27, aged 71, of cerebral hemorrhage.

Andrew Jackson Perolio, Montgomery, Ala.; Gate City Medical College, Dallas, Texas, 1907; served during World War I; for many years affiliated with the division of typhus fever control of the Alabama Department of Public Health; died in the Emory University Hospital, Atlanta, Ga., February 14, aged 57, of coronary thrombosis.

William Nelson Pettee, Denver; University of Buffalo School of Medicine, 1899; died January 24, aged 72, of carcinoma of the lung and rectum.

Lloyd Cyril Pierce, Harrisburg, Pa.; University of Pennsylvania School of Medicine, Philadelphia, 1926; member of the American Medical Association and the Harrisburg Academy of Medicine; served during World War I; died March 22, aged 48, of hypertension.

Francis Nicolaus Pitass, Buffalo; University of Buffalo School of Medicine, 1899; died in the Buffalo General Hospital February 2, aged 73, of arteriosclerotic heart disease with decompensation.

Jacob C. Poling, Ansonia, Ohio; Miami Medical College, Cincinnati, 1905; member of the American Medical Association; died in the Wayne Hospital, Greenville, February 4, aged 74, of heart disease.

Julius Raab ✠ New York; Medizinische Fakultät der Universität Wien, Vienna, Austria, 1919; member of the American Academy of Dermatology and Syphilology; specialist certified by the American Board of Dermatology and Syphilology; attending dermatologist, Beekman Hospital and associate dermatologist at the Hospital for Joint Diseases; died February 7, aged 51, of carcinoma.

Murray Mechling Rarick, Columbus, Ohio; Starling Medical College, Columbus, 1898; recently retired after two years on the staff of the state industrial commission; for many years on the staff of the Dayton State Hospital, Dayton, and physician for the Pennsylvania Railroad; died in the University Hospital February 15, aged 71, of coronary disease.

Thomas Jackson Ray ✠ Lexington, Ky.; Memphis (Tenn.) Hospital Medical College, 1896; on the staffs of the Good Samaritan and St. Joseph's hospitals; died February 4, aged 78, of coronary heart disease.

Lawrence Ewing Reves, Monette, Ark. (licensed in Arkansas in 1903); died February 11, aged 70, of heart disease.

Charles Wright Reynolds ✠ Holton, Kan.; Keokuk (Iowa) Medical College, 1897; died January 31, aged 74, of cerebral hemorrhage.

James Weldin Richards, Le Claire, Iowa; St. Louis College of Physicians and Surgeons, 1898; died in Lake Geneva, Wis., March 7, aged 75, of coronary occlusion.

Cheslie Alvah Clarence Richardson, Somerville, Mass.; McGill University Faculty of Medicine, Montreal, Que., Canada, 1904; member of the American Medical Association; formerly chairman of the city board of health; a member of the executive board, chief surgeon and president of the medical staff at the Somerville Hospital; died January 30, aged 73, of coronary thrombosis.

John Turner Robinson, Bound Brook, N. J.; Hahnemann Medical College and Hospital of Philadelphia, 1896; for six years mayor of Bound Brook; on the staff of the Muhlenberg Hospital, Plainfield; died February 18, aged 79, of cardiovascular collapse.

Lester Daniel Rusk, Sioux City, Iowa; Sioux City College of Medicine, 1907; member of the American Medical Association; died January 22, aged 72, of cerebral thrombosis.

James Henry Savage, Atlanta, Ga.; Atlanta Medical College, 1915; member of the American Medical Association; also a pharmacist; died in the Crawford W. Long Memorial Hospital February 8, aged 61, of coronary occlusion.

Robert Burns Scott, Philadelphia; Jefferson Medical College of Philadelphia, 1896; also a druggist; died in January, aged 77.

Michael James Shaughnessy, Framingham, Mass.; Harvard Medical School, Boston, 1907; member of the New England Obstetrical and Gynecological Society; fellow of the American College of Surgeons; for many years medical examiner of the eighth Middlesex district; served on the staff of the Framingham Union Hospital; died February 17, aged 63.

William James Shoemaker, Lock Haven, Pa.; University of Maryland School of Medicine, Baltimore, 1882; member of the American Medical Association; coroner of Clinton County; on the staff of the Lock Haven Hospital; died January 22, aged 92, of bronchitis.

Lawrence Martin Sifrit, Columbus, Ohio; Starling Medical College, Columbus, 1891; served on the staff of St. Francis Hospital; died January 25, aged 74.

James Frank Sigafoos, Orting, Wash.; John A. Creighton Medical College, Omaha, 1910; member of the American Medical Association; served in the medical corps of the U. S. Army during World War I; died January 30, aged 57, of coronary thrombosis.

Esmonde Bathgate Smith ✠ Brooklyn; Cornell University Medical College, New York, 1909; member of the American Society of Clinical Pathologists; pathologist at the Methodist Hospital, where he died February 2, aged 57, of coronary thrombosis.

Harry Boydston Smith, Blairsville, Pa.; Medico-Chirurgical College of Philadelphia, 1902; died February 18, aged 78, of pulmonary edema and asthma.

Charles Hugh Tate ✠ Dayton, Ohio; Baltimore Medical College, 1898; member of the Clinical Orthopedic Society; past president of the Montgomery County Medical Society; on the staffs of the Good Samaritan and St. Elizabeth hospitals; died February 3, aged 69, of coronary thrombosis.

Ernest Z. Wanous ✠ Minneapolis; University of Minnesota College of Medicine and Surgery, Minneapolis, 1897; an Affiliate Fellow of the American Medical Association; at one time served as assistant superintendent of the Minneapolis General Hospital and as assistant superintendent of the State Hospital in Rochester, Minn.; died January 5, aged 69, of ascending pyelonephritis from cord bladder and decubitus ulcers.

John P. Watkins, Detroit; Meharry Medical College, Nashville, Tenn., 1909; associated with the Wayne Diagnostic and Parkside hospitals; died January 24, aged 61, of uremia and hypertensive heart disease.

Joseph Robbins Wetherbee ✠ Eugene, Ore.; Jefferson Medical College of Philadelphia, 1900; served during World War I, and on the staffs of the Good Samaritan and St. Vincent's hospitals, Portland, and the Sacred Heart General Hospital; died January 12, aged 73, of cardiac thrombosis.

Ira C. Willan, Morgantown, Ind.; Medical College of Indiana, Indianapolis, 1883; died in Martinsville January 29, aged 85, of uremia, chronic nephritis and prostatic hypertrophy.

William Mitchell Wolf ✠ San Antonio, Texas; University of Texas School of Medicine, Galveston, 1899; fellow of the American College of Surgeons; served as first vice president in 1903 and as president in 1905 of the Bexar County Medical Society; a major in the medical corps of the U. S. Army during World War I; interned at the Santa Rosa Hospital, where he also served as house physician for seven years; died while visiting on a ranch near San Antonio December 8, aged 70, of heart disease.

Morton F. Wolfe, New Albany, Ind.; University of Louisville School of Medicine, Louisville, Ky., 1932; served as health officer of Floyd County; began active duty as a captain in the medical corps of the Army of the United States on June 19, 1942; received a medical discharge because of physical disability; died in the University Hospital, Ann Arbor, Mich., February 6, aged 40, of coronary occlusion and hypertension.

Henry Willis Wood, Sheldon, Ill.; Columbus Medical College, 1891; member of the American Medical Association; past president of the school board; local surgeon for the New York Central and the Toledo, Peoria and Western railroads; member of the Illinois State Medical Society "Fifty Year Club"; died March 8, aged 82, of coronary thrombosis.

Lewis Miller Woodson, Gallatin, Tenn.; University of Louisville (Ky.) Medical Department, 1885; past president of the Sumner County Medical Society; a charter member of the Rotary Club and the chamber of commerce; surgeon for the Louisville and Nashville Railroad for many years; died February 22, aged 80, of uremia.

Wilson Briggs Zimmer ✠ Brooklyn; Cornell University Medical College, New York, 1905; served as president of the Flatbush Medical Society; on the staff of the Midwood Hospital; died February 5, aged 62, of coronary occlusion.

Correspondence

THE TREATMENT OF ERYTHROBLASTOSIS FETALIS

To the Editor:—The case of the recently publicized "Rh baby" suggests need for an evaluation of the current method of treatment in erythroblastosis fetalis and of its effectiveness. The procedure usually undertaken is the administration of relatively small amounts, 50 to 60 cc. once daily, of compatible blood from an Rh negative donor. The object is the replacement of the "hemolyzed" Rh positive erythrocytes of the infant with cells which will not be "hemolyzed" in order to preserve an adequate oxygen-carrying capacity of the blood. This replacement is usually the only therapeutic measure considered necessary, since "hemolysis" is conceived to be the cause of all the other abnormal symptoms and findings. The effectiveness of the current treatment can be judged by the unfavorable prognosis commonly held. Potter recently reported the production of an unaffected child by the artificial insemination of an Rh negative woman with semen from an Rh negative donor. This procedure was undertaken following the birth of twins both of whom died, the clinical diagnosis of erythroblastosis being confirmed by postmortem examination. The father of the twins was Rh positive. While this report is of the greatest scientific interest, it must be emphasized that resort to such a procedure deprives two married people of a mutually produced child and an innocent man of fatherhood of a child by his own wife. It reflects the pessimism felt by many physicians regarding the outcome in this disease. This pessimism, I believe, results from the inadequacy of the treatment usually employed.

A description of the pathogenesis of erythroblastosis fetalis will not be attempted here, but I should like to point out that "passive isosensitization" of the infant explains more completely than "isoimmunization" all the manifestations of the disease except in that form characterized only by a nonregenerative anemia. On the basis of this conception of the pathogenesis, the red cell destruction is of secondary importance while damage to the liver and lungs, the "shock organs" so obviously seen to be involved on necropsy, is of primary concern. The treatment suggested by this concept therefore includes not only intravenous administration of compatible blood but also oxygen, glucose and sometimes calcium, to reduce anoxia, support the liver, maintain capillary integrity and improve blood coagulability. The use of the mother's blood is, of course, contraindicated, as is her milk.

Compatible Rh positive blood has given uniformly good results in my experience. Its use was continued after the discovery by Levine of the role of the Rh factor in the etiology of this disease, because it was considered probable that most of the transfusions given before this discovery had been with Rh positive blood, and the improvement in the transfused infants had always been dramatic. I now use Rh positive blood by preference because of its sparing action on the infant's red cells, its greater desensitizing effect and its availability from the patient's family, a factor which may be of importance in a low-income family. No infant should die while Rh negative blood donors are being sought. Having observed the response to the use of Rh negative blood in a number of cases, I find no valid reason, either in the observed cases or in those reported in the literature, for insisting on the use of Rh negative blood in this disease. The response to the first transfusions is short lived in the severely affected infant whether he receives Rh negative or Rh positive blood. If the transfused red cells are not destroyed, the infant's own cells are, and the net result is the same as far as the erythrocytes are concerned. In only 2 instances in a series of cases in which untested or Rh positive blood was used did the jaundice last sixteen days or longer. One was an infant delivered by high forceps after a long and difficult labor. The first transfusion in this case was of Rh negative blood because an Rh negative donor had been obtained for the mother, and some of this blood was at hand. In another infant in whom the icterus index was 190 on the third day, following two administrations of plasma only, the skin began to clear with the second transfusion of Rh positive blood and the jaundice had completely disappeared by the sixteenth day. Contrary to current opinion, compatible Rh positive blood has not and should not have a detrimental effect on the baby's own blood.

The blood should be given in adequate amounts. Sanford suggests 10 to 15 cc. per pound of body weight; this would be 60 to 90 cc. for a 6 pound baby and more for a larger child. If the anemia in the cord blood is severe—and the cord blood should always be examined when a previous child of the mother has been affected—or if the nucleated red cell count is high and edema or hemorrhagic manifestations appear in any part of the body, a second transfusion should be given in twelve to twenty-four hours. The aim is to reduce the anoxia, bring the serum albumin to a safe level and improve the coagulability of the blood. Transfusions should be repeated whenever the child appears "toxic." According to the concept of pathogenesis suggested, this toxic condition is due to the damaging biochemical effects (release of histamine or histamine-like substances among others, for example) of the antigen-antibody reaction in the sensitized child. A "toxic" baby with a red cell count of 4,000,000 per cubic millimeter of blood is therefore in far greater need of an immediate transfusion than a nontoxic baby with a count of 2,000,000 red cells. Ignorance of this fact is probably responsible for some deaths in this disease. With Rh positive blood there is no danger, when a transfusion is thus indicated, of flooding the circulatory system with an excess of erythrocytes, since the Rh positive cells absorbing the isoantibodies are destroyed. In the nontoxic child it is entirely safe to delay blood replacement to the point where the erythrocyte level is 2,500,000, since anemia is not the cause of the toxic symptoms. Whole blood should be used exclusively, as plasma is ineffective, and it should always be given into the vein. The multiple syringe method of administration is to be preferred to the gravity method because of the small caliber of the veins in the newborn.

Oxygen should be given constantly, 3 to 4 liters per minute, as long as nucleated red cells are present in the blood smear, since their presence suggests an anoxic type of anoxemia. Subsequently, as long as the jaundice persists, it may be given for fifteen to thirty minute periods six to eight times daily after feedings to improve hepatic efficiency.

Venoclysis of 80 to 100 cc. of 5 per cent glucose in isotonic solution of sodium chloride may be given slowly once or twice daily if a cannula has been left in place, or subcutaneous injections of 5 per cent glucose in distilled water should be given twice daily in amounts of 30 to 40 cc. if the cannula has been removed. Glucose can thus be given in larger amounts than by mouth alone without deranging the digestive system. This therapy is likewise continued until the disappearance of the jaundice.

Calcium gluconate, 5 to 10 cc. of the 10 per cent solution, may be given intravenously at the time of a transfusion. This is especially indicated if any tendency to hemorrhage is noted, since coagulation of the blood in this disease seems to be improved by calcium more effectively than by vitamin K. It may also operate to reduce the permeability of the capillaries.

Deliberate premature delivery will not prevent or modify the disease. Birth, necessitating the separation of the infant from

the mechanisms provided within the uterus for oxygenation and the removal of toxic substances, usually precipitates the symptoms of the disease and renders the pathologic processes more fulminating. Furthermore, sensitization does not parallel the number of antibodies either in the blood or in the body tissues. It may rather be associated with the smaller titers, since one injection of an antigen may often sensitize while a larger number of injections may produce a relative immunity. Therefore there is no assurance that the sensitized child will be in any way protected by depriving him of the last few weeks of gestation. Prematurity is only a further complication.

The treatment outlined has been used for the past eight years and has given consistently good results. It permits a good prognosis in the large majority of cases. It cannot, however, restore to normalcy a child whose brain has been previously damaged. Such damage is fortunately present in only a relatively small number of those affected and seems to bear no relationship to the severity of the other symptoms. Prompt diagnosis and immediate initiation of therapy, especially the transfusions and oxygen, are of course imperative.

Early recognition of the condition is usually not difficult. Brown amniotic fluid is sometimes seen at birth. Jaundice within the first hours of life, pallor of the palms, the soles of the feet, the lips and mucous membranes of the mouth, and later of the skin in which the jaundice appears lemon yellow, enlargement of the liver and spleen and edema of the extremities or scrotum in some cases are all early signs which should not be disregarded. Soon the extremities begin to lose tone, the infant becomes less easily aroused although he may appear hyperirritable on handling, and a weak, high pitched cry may denote edema of the vocal cords; edema of the extremities may appear if not present earlier. This is the picture of the "toxic" state to which I have already referred. A blood smear showing nucleated red cells is corroborative but not pathognomonic, and they may be few or absent. The erythroblastemia usually reflects the severity of the condition, but it must not be relied on as an absolute diagnostic sign.

In the earliest American report on this disease, I. A. Abt commented on the strength, robustness and maturity of most of these children at birth. With prompt and adequate treatment ultimate complete recovery should be the rule.

RUTH RENTER DARROW, M.D., Chicago.

FAREWELL AND THANK YOU FROM QUEENSLAND

To the Editor:—For the past three years United States troops have been among us in this country, and among them have been medical units of both the Army and the Navy.

Now, when the tide is receding and they are leaving our shores, this committee wishes to publish through your columns our feelings of gratitude and friendship to these our colleagues.

Not only do we owe a very real debt of gratitude to those American women and men who, in our imminent danger, stood by the side of our own troops and saved this country and especially this state from Japanese invasion, but to our colleagues in the Medical Services we owe a special debt.

This body, as its name implies, is concerned with postgraduate teachings—and the call for such teaching was increased, not diminished, by the war. Owing to shortages of our own members this was a matter of the greatest difficulty, and our efforts were confined to a special week-end course once a quarter. Even this slender effort would have been impossible without the enthusiastic cooperation of your medical services. Their members were ready at any time to hold clinical meetings and to give demonstrations and lectures, and while the mental was not forgotten the physical hospitality too was so lavish as to be almost embarrassing.

When all were so good, it is impossible to name either individual teachers or units; looking back, one feels "They were all good."

To their routine hospital meetings our members were always welcome—it was a constant regret that, owing to the pressure of their practices, so few were able to accept their invitations.

As well as at the bases in the forward areas the U. S. Medical Services cooperated with the Australian Army Medical Services in keeping up medical teaching and research.

So in this area we are sorry to have to record the end of a period of particularly happy cooperation and friendship.

A. E. PATERSON, Brisbane, Queensland, Australia.
Honorary Secretary, Postgraduate Medical Education Committee, University of Queensland Medical School.

MORPHINE WITH PENTOTHAL ANESTHESIA

To the Editor:—Morphine is frequently used to supplement pentothal sodium in the production of anesthesia. It is definitely synergistic with and potentiates the action of pentothal. One frequently observes that administration of morphine during the course of a pentothal anesthetic will decrease the required pentothal dose.

Occasionally it has been overlooked not only that morphine potentiates the action of pentothal but that pentothal will potentiate the action of morphine. When morphine is administered to a patient postoperatively it is important to know whether such a patient has received a pentothal anesthetic. If he has, and the fact is disregarded, the morphine administered may produce a clinical narcotic effect far greater than was desired or anticipated. Such a situation will exist when a high concentration of pentothal persists for several hours after surgery, a situation to be suspected when a patient has received several grams of pentothal or when prolonged emergence from anesthesia indicates slow destruction of the drug in the blood stream.

Two cases will illustrate:

CASE 1.—A man aged 35 received 2 Gm. of pentothal during the repair of an abdominal wall defect. Recovery from anesthesia was prolonged; after several hours the patient began to groan. One-fourth grain (0.016 Gm.) of morphine was given, and very shortly thereafter the patient sank into a deep coma from which he could not be roused. The substantial dose of morphine, reinforced by some pentothal residual in the blood stream, promptly reanesthetized the patient.

CASE 2.—A patient received a bilateral intercostal block for an emergency laparotomy. Pentothal sodium was administered to produce unconsciousness. The block wore off after ninety minutes, after which increased dosage of pentothal plus 50 per cent nitrous oxide supplemented the anesthesia. The operation lasted about three hours, and at its termination the patient was in poor condition. A total of 2 Gm. of pentothal was used. Recovery from anesthesia was slow; even six hours after the operation the patient could hardly be roused. During the evening, as a result of some moaning, the patient was given ¼ grain of morphine by the ward attendant. The patient quieted down, and respirations were considerably slowed. After six hours more of unconsciousness the patient died. The severe postoperative shock was aggravated by the prolonged unconsciousness, the respiratory depression and a developing pulmonary edema.

The morphine-pentothal synergism is routinely considered during the preoperative and intraoperative periods. It ought not to be overlooked during the postoperative phase.

SAMUEL L. LIEBERMAN, Captain, M. C., A. U. S.

"ABDOMINAL PAIN IN CHILDREN"

To the Editor:—In going over Dr. Brennemann's article on abdominal pain in children in the March 24 issue of THE JOURNAL I note that diabetic acidosis and pyelonephritis are not mentioned as causes of acute abdominal pain often difficult to differentiate from the so-called "acute surgical abdomen." These are not infrequently met and need differentiation by urinary findings, although if the physical signs indicate a strong possibility of acute appendicitis it is safer to operate than to let it alone, the diabetes and its acidosis being possible of control despite the operation.

SAMUEL GITLOW, M.D., New York.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Hospitals Not for Profit: Applicability of National Labor Relations Act Requiring Collective Bargaining with Employees in the District of Columbia.—The Central Dispensary and Emergency Hospital is a nonprofit, charitable corporation located in the District of Columbia, whose services are available to patients regardless of their ability to pay. Sometime prior to the decision here reported a local union attempted to organize hospital employees performing nonprofessional services, and the National Labor Relations Board held an election among such employees on the question as to whether or not that union should be their bargaining representative. Of 251 employees eligible to vote only 108 voted, of whom only 75 voted to make the union their bargaining representative. The National Labor Relations Board on the basis of that election, ordered the hospital to bargain collectively with the union and petitioned the United States court of appeals, District of Columbia, for the enforcement of that order against the hospital.

The National Labor Relations Act, which has application to employment in the District of Columbia, creates the National Labor Relations Board with specified powers, one of which is to require an employer to bargain collectively with a union chosen by the employees of a particular establishment as their bargaining agency. The act applies to employments in "commerce," which section 2(6) of the act defines as "trade, traffic, commerce, transportation or communication among the several states or between the District of Columbia or any territory of the United States and any state or other territory, or between any foreign country and any state, territory or the District of Columbia, or within the District of Columbia. . . ." The hospital contended that the National Labor Relations Act did not apply to it and that consequently the order of the National Labor Relations Board requiring it to bargain collectively with the union is void, since the hospital is a nonprofit charitable institution not engaged in trade, traffic, commerce or transportation within the meaning of the act. The activities, said the court, whose opinion was written by Associate Justice Thurman Arnold, carried on by the hospital are trade and commerce, and the fact that those activities are carried on by a charitable hospital is immaterial. In *American Medical Associaton* v. *United States*, 76 U. S. App. D. C. 70, 130 F. (2d) 233 (1942), this court held that the sale of medical and hospital services for a fee has been considered as trade by English and American common law cases going back to 1793. In *Jordan* v. *Tashiro*, 278 U. S. 123 (1928) the operation of a general hospital was held by the Supreme Court to be a "business undertaking," and such activity was included within the meaning of the words trade and commerce as used in a treaty with Japan.

The respondent argued, however, that the spirit or policy of the National Labor Relations Act is such that there should be read into it an exemption in favor of charitable hospitals, relying on *Western Pennsylvania Hospital* v. *Lichliter*, 340 Pa. 382, 17 A. (2d) 206, J. A. M. A. **117**:475 (Aug. 9) 1941, in which the Supreme Court of Pennsylvania held that even though the words of the Pennsylvania State Labor Relations Act might be broad enough to include a hospital nevertheless the legislature did not intend to apply the act to such institutions.[1] We are unable to follow the reasoning of the Pennsylvania court, said the district court of appeals. We cannot understand what considerations of public policy "deprive" hospital employees of the privilege granted to employees of other institutions. The court then referred to opinions of the Supreme Courts of Minnesota and Wisconsin, respectively, in *Northwestern Hospital* v. *Public Building Service Employees' Union Local No. 113*, 208 Minn. 389, 294 N. W. 215, J. A. M. A. **117**:474 (Aug. 9) 1941 and *Wisconsin Employment Relations Board* v. *Evangelical Deaconess Society*, 242 Wis. 78, 7 N. W. (2d) 590 (1943), which held that charitable hospitals and their nonprofessional employees were subject to the labor relation acts of those states. These opinions, the court concluded, present what seem to it the only tenable view as to the spirit and policy of labor relation acts.

The appellate court accordingly entered a decree directing the enforcement of the order of the National Labor Relations Board, which, in effect, required the hospital to bargain collectively with the union.—*National Labor Relations Board v. Central Dispensary and Emergency Hospital, 145 F. (2d) 852 (1944).*

Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

BOARDS OF MEDICAL EXAMINERS BOARDS OF EXAMINERS IN THE BASIC SCIENCES

Examinations of the boards of medical examiners and boards of examiners in the basic sciences were published in THE JOURNAL, April 21, page 1076.

NATIONAL BOARD OF MEDICAL EXAMINERS

NATIONAL BOARD OF MEDICAL EXAMINERS: Parts I and II, May 1-3 and July 16-18. Part III. Various centers, June. Exec. Sec., Mr. E. S. Elwood, 225 S. 15th St., Philadelphia.

EXAMINING BOARDS IN SPECIALTIES

AMERICAN BOARD OF INTERNAL MEDICINE: *Oral.* New Orleans, May 21-22, Philadelphia, June 7-8 and Chicago, June 27-29. *Written.* Oct. 15. Final date for filing application is Aug. 1. Candidates in the armed forces may take the examination at their station with the permission of their medical commanding officer. Asst. Sec., Dr. W. A. Werrell, 1301 University Ave., Madison 5, Wis.

AMERICAN BOARD OF NEUROLOGICAL SURGERY: Chicago, May 28. Sec., Dr. Paul Bucy, 912 S. Wood St., Chicago 12.

AMERICAN BOARD OF OBSTETRICS & GYNECOLOGY: *Part II. Oral.* Atlantic City, June 13-19. Sec., Dr. Paul Titus, 1015 Highland Bldg., Pittsburgh 6.

AMERICAN BOARD OF OPHTHALMOLOGY: New York, June 13-16; Chicago, Oct. 4-6; and Los Angeles, January. Sec., Dr. S. Judd Beach, 56 Ivie Rd., Cape Cottage, Me.

AMERICAN BOARD OF ORTHOPAEDIC SURGERY: *Part I. Oral and Written.* New Orleans, Sept. 28-29, New York, Oct. 5-6, Chicago, Oct. 12-13 and San Francisco, Oct. 19-20. Final date for filing application is August 1. Sec., Dr. G. A. Caldwell, 3503 Prytania St., New Orleans 15.

AMERICAN BOARD OF OTOLARYNGOLOGY: Chicago, Oct. 3-6. Sec., Dr. Dean M. Lierle, University Hospital, Iowa City, Ia.

AMERICAN BOARD OF PATHOLOGY: Philadelphia, June 13-14. Final date for filing application is May 15. Sec., Dr. F. W. Hartman, Henry Ford Hospital, Detroit 2.

AMERICAN BOARD OF RADIOLOGY: *Oral.* New York, June 3. Final date for filing application is May 1. Sec., Dr. B. R. Kirklin, 102-110 Second Ave. S.W., Rochester, Minn.

AMERICAN BOARD OF SURGERY: *Written.* Various centers, October. Final date for filing application is Aug. 1. Sec., J. S. Rodman, 225 S. 15th St., Philadelphia 2.

AMERICAN BOARD OF UROLOGY: *Written.* Chicago, Dec. 9. *Oral.* Chicago, Feb. 19-22. Sec., Dr. Gilbert J. Thomas, 1409 Willow St., Minneapolis 4.

1. See special article in THE JOURNAL **117**: 461-463 (Aug. 9) 1941, entitled "Courts and the Unionization of Hospital Employees," discussing the legal problems involved in this field.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1935 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American J. Digestive Diseases, Fort Wayne, Ind.

12:33-60 (Feb.) 1945

*Comparison of Gastric Acidity Among Men and Women Suffering from Duodenal Ulcer as Determined by Fractional Analysis of Gastric Contents After Injection of Histamine. G. E. Brown Jr. and A. B. Rivers.—p. 33.
Use of Naturally Carbonated Saline-Alkaline Mineral Waters in Conditions Affecting Alimentary Tract. W. S. McClellan.—p. 36.
Ambulatory Proctology. A. J. Cantor.—p. 42.
Association of Squamous Cancer with Anal Manifestations of Lymphogranuloma Venereum. G. E. Binkley and W. A. Derrick.—p. 46.
Clinical and Therapeutic Evaluation of Portal Cirrhosis. N. W. Chaikin and D. Schwimmer.—p. 47.
Gastritis Simulated by Hyperfunctioning Stomach. M. E. Dailey.—p. 53.
Persistent Vomiting Due to Giardiasis. M. Weingarten and S. Rosenfeld.—p. 54.

Gastric Acidity in Men and Women with Duodenal Ulcer.—Brown and Rivers point out not only that duodenal ulcers are much more frequent in men than in women but that ulcers in women are generally more responsive to treatment and less likely to recur. They investigated the part the chemical factor plays in causing women to respond so much better than men to various conservative methods of treatment of ulcer. They believe that one can evaluate the chemical factor most effectively by a study of the gastric acidity through fractional analysis of gastric contents after injection of histamine. A study on 35 women and 35 men with duodenal ulcer revealed that male patients have much higher values than female patients for free hydrochloride acid and total acid in response to injection of histamine. The higher incidence of hyperacidity may help to explain the greater tendency to intractability of duodenal ulcer in men. Neurogenic causes, on the other hand, are usually very apparent among women who have duodenal ulcer. The utilization of this information is clinically important in determining the type and intensity of treatment of duodenal ulcer.

American Journal of Medical Sciences, Philadelphia

209:141-280 (Feb.) 1945

Filariasis in Soldiers on Island in South Pacific. T. D. Englehorn and W. E. Wellman.—p. 141.
Summary of Three Year Study of Clinical Applications of Disinfection of Air by Glycol Vapors. T. N. Harris and J. Stokes Jr.—p. 152.
Experimental Air Borne Tuberculosis. M. B. Lurie.—p. 156.
Present Status of Glycol Vapors in Air Sterilization. M. Hamburger Jr., O. H. Robertson and T. T. Puck.—p. 162.
Recent Studies on Control of Dust Borne Bacteria by Treatment of Floors and Bedclothes with Oil. C. G. Loosli and O. H. Robertson.—p. 166.
Sampling Devices. H. G. DuBuy and A. Hollaender.—p. 172.
Measurement of Air Borne Infection by Disinfection of Air. W. F. Wells.—p. 177.
Incidence of Sicklemia and Sickle Cell Anemia in 3,000 Canal Zone Examinations on Natives of Central America. W. J. Tomlinson.—p. 181.
Studies of Plasma Volume in Human Being: Comparative Results of Reduction of Plasma Volume, Intramuscular Pressure and Venous Pressure in Surgical Shock. H. H. Henstell and L. Gunther.—p. 187.
Aberrant Atrioventricular Conduction in Case Showing Short PR Interval and Abnormal but Not Prolonged QRS Complex. T. T. Fox.—p. 199.
Significance of Pulmonary Diastolic Murmur in Cases of Mitral Stenosis. A. A. Luisada and L. Wolff.—p. 204.
Spontaneous Mediastinal Emphysema with Pneumothorax Simulating Organic Heart Disease. H. Miller.—p. 211.
Method for Measuring Small Amounts of Weight Loss in Man. G. E. Burch.—p. 220.
Relation of Total Insensible Loss of Weight to Water Loss from Skin and Lungs of Human Subjects in Subtropical Climate. G. E. Burch and T. Winsor.—p. 226.
Use of Posterior Pituitary Extract in Tests of Urinary Concentration. R. D. Taylor, J. D. Peirce and I. H. Page.—p. 235.
Somatic Pain: Diagnostic and Therapeutic Aspects of Local Infiltration. B. Judovich.—p. 240.

American J. Obstetrics and Gynecology, St. Louis

49:159-306 (Feb.) 1945. **Partial Index**

*Value of Vaginal Smears in Diagnosis of Early Malignancy. Charlotte A. Jones, T. Neustaedter and L. L. Mackenzie.—p. 159.
*Cervical Pregnancy. W. E. Studdiford.—p. 169.
Rule of Intermittent Contractions of Uterus in Process of Labor. D. P. Murphy.—p. 186.
Prevention of Cancer of Cervix. B. Z. Cashman.—p. 190.
Analysis of Effects of Continued Thiourea Treatment in Pregnancy and on Development of Offspring in Rat. E. D. Goldsmith, A. S. Gordon and H. A. Charipper.—p. 197.
Squamous Metaplasia of Cervix Uteri. S. H. Auerbach.—p. 207.
*Rapid Treatment of Early Syphilis During Pregnancy. M. D. Speiser, G. Wexler, E. W. Thomas and H. A. Asher.—p. 214.
Neisserian Infection in Pregnancy. P. M. Rice.—p. 226.
Cortical Necrosis of Kidneys Associated with Necrosis of Pituitary in Obstetric Shock. W. J. Tomlinson.—p. 236.
Massive Obstetric Hemorrhage Requiring Hysterectomy. A. B. Hunt.—p. 246.
Use of New Contrast Medium (Visco-Rayopake) in Female Generative Tract. W. B. Norment.—p. 253.
Adenoacanthoma of Uterus. J. E. Ayre.—p. 261.
Cystic Pelvic Chordoma Simulating Ovarian Cyst. W. J. Reich and M. J. Nechtow.—p. 265.
Pregnancy Complicated by Addison's Disease. D. E. Sheldon.—p. 269.
Intragroup Hemolytic Transfusion in Rh-Positive Patient. G. Speck and E. B. Sonn.—p. 273.
Thoracopagus Twins. E. A. Graber.—p. 276.
Unusual Sequel to Attempted Criminal Abortion. E. J. Bateman.—p. 280.
Torsion of Apparently Normal Ovary, and Spontaneous Amputation of Fallopian Tube During Adolescence. H. E. Anderson.—p. 283.

Vaginal Smears in Early Cancer.—Jones and her associates report microscopic examinations of vaginal fluid aspirated as a routine procedure from 427 gynecologic patients. The equipment necessary consists of a slightly curved glass pipet to which are attached a small rubber suction bulb, two microscopic slides, each equipped with a paper clip, and a fixative (a mixture of equal parts of 95 per cent ethyl alcohol and ether). The smear is taken before any examining lubricant is used. The labia are separated and the pipet is introduced high into the vaginal vault, with the bulb compressed. As the pipet is withdrawn the bulb is slowly decompressed. The material thus obtained is sprayed over the surface of the slide and spread evenly. The moist slides are immediately immersed in the fixing solution, where they may remain for an indefinite period. Then they are stained. In 91 of the 427 patients a diagnosis of cancer was made from the vaginal smears, of which 82 were confirmed by biopsy or curettage. The procedure is a valuable addition to the methods utilized for the early diagnosis of pelvic carcinoma. When suggestive cells are present, even though few, the patient should be investigated further. Although most are eventually proved negative, an occasional early lesion will be detected, which otherwise might have been completely overlooked.

Cervical Pregnancy.—Cervical pregnancy has been given scant consideration in American medical literature. Studdiford tabulates 28 cases that he found mostly in the foreign literature and reports observations on 2 patients in whom clinical evidence points to the cervix as the primary nidation site. Cervical pregnancy is a definite, though rare, entity. Many cases may be unrecognized. Such pregnancies are rarely carried beyond the twentieth week of gestation. Usually it is necessary to intervene surgically before the fifth month because of hemorrhage, rupture of the amniotic sac or perforation of the cervical wall. Profuse and violent hemorrhage accompanies the attempt to remove the placenta. Enlargement and expansion of the cervix accompanied by bleeding in the early months of pregnancy, and detection of the corpus uteri surmounting the cervical mass should be regarded as suggestive of this condition. Supravaginal rupture of the cervix should be treated by prompt and radical intervention. Intravaginal rupture of the cervix can sometimes be treated more conservatively; however, this complication may require cervical amputation or complete hysterectomy to control hemorrhage. When perforation is not present, the placenta in most instances can be evacuated partially or completely, either manually or instrumentally; the hemorrhage can be controlled by packing. Blood for transfusion should be available to combat the large blood loss which may be expected in cases treated by placental removal. With the use of large and repeated transfusions the need for radical operation can be

sharply reduced. On the rare occasion when such a pregnancy progresses beyond the fourth month, complete hysterectomy may well be the safer approach.

Rapid Treatment of Early Syphilis During Pregnancy.—Speiser and his co-workers administered mapharsen to 43 pregnant patients with early syphilis. One death from arsenical encephalopathy occurred in this group. Of the 30 patients with early infectious syphilis who completed treatment and were kept under observation, good results from this therapy were obtained in 76.6 per cent. Between 1936 and 1940, prior to the advent of massive arsenotherapy, there were 34 pregnant patients treated for early infectious syphilis with routine therapy. One death occurred from arsenical encephalopathy, 5 patients developed jaundice and 1 developed exfoliative dermatitis. Only 50 per cent of the offspring were free from syphilis. In the relatively small series reported here, intensive therapy proved safer and more effective than routine treatment. There remains the risk of arsenical encephalopathy, and this is probably greater with intensive mapharsen therapy than when the same drug is employed in routine treatment.

American Journal of Public Health, New York

35:89-190 (Feb.) 1945

Today's Global Frontiers in Public Health: I. Pattern for Cooperative Public Health. G. C. Dunham.—p. 89.
Id.: II. Regional Health Organization in Far East. S. Sze.—p. 96.
Id.: III. Potentialities of International Collaboration in Field of Public Health. M. D. Mackenzie.—p. 100.
Id.: IV. Immediate World Task in Public Health. J. A. Crabtree. —p. 106.
Public Health Aspects of Psychosomatic Problems. F. Dunbar.—p. 117.
Relating Psychosomatic Viewpoint to Public Health Nursing. Ruth Gilbert.—p. 123.
Preparation of Public Health Nurse to Meet Psychosomatic Problems in Today's Health Program. Mary C. Connor.—p. 133.
Effect of Increased Birth Rate on Maternal and Child Health Problems. J. M. Saunders.—p. 140.
Nutritional Problems That Arise in Large Scale Cookery. C. M. McCay. —p. 143.
Proposed Typhoid Immunogenic Unit for Evaluation of Antityphoid Immunizing Substances. G. F. Luippold.—p. 153.

Am. J. Roentgenol. & Rad. Therapy, Springfield, Ill.

53:1-108 (Jan.) 1945

Roentgen Pathology of Chest in Battle Casualties. D. S. Carroll and P. Ciaglia.—p. 1.
Pneumomediastinum in Newborn. R. M. Lowman and C. S. Culotta. —p. 7.
Echinococcus Cyst of Heart: Report of Case. J. Zizmor and M. M. Szucs.—p. 15.
Hypertrophic Gastritis Simulating Intramural Tumor of Stomach. C. L. Hinkel.—p. 20.
Multiple Diffuse Pancreatic Lithiasis: Roentgen Anatomy of Pancreas: Case Report. H. H. Sage.—p. 28.
Multiple Plasmocytoma of Jejunum: Report of Case. J. J. Esposito and A. P. Stout.—p. 33.
Study of Relative Importance of Cortex and Spongiosa in Production of Roentgenogram of Normal Vertebral Body. G. W. Wagoner, A. D. Hunt Jr. and E. P. Pendergrass.—p. 40.
Pseudarthrosis, Synchondrosis and Other Anomalies of First Ribs. J. Gershon-Cohen and R. E. Delbridge.—p. 49.
Early Recognition of Endocrine Disorders in Childhood by Roentgenograms of Wrist to Determine "Ossification Index." D. W. Leonard. —p. 55.
*Postirradiation Bone Changes. F. R. Gratzek, E. G. Holmstrom and Leo G. Rigler.—p. 62.
Volume Dosage in Radiation Therapy. B. S. Wolf.—p. 77.

Postirradiation Bone Changes.—Gratzek and his associates cite the case of a child in whom retardation of bone growth resulted from roentgen irradiation of a hemangioendothelioma of the right thigh. The child was 5 months old at the onset of the roentgen treatment. At the age of 9 years the right femur was 3 cm. shorter than the left and was smaller in circumference. A year later the difference between the two femurs remained about the same. Observations made at the University of Minnesota Hospitals, where since 1940 routine roentgenograms of the pelves of all individuals referred for high voltage roentgen therapy of malignant conditions of the pelvis have been made before treatment and at yearly intervals thereafter and observations on patients treated since 1936 and reexamined roentgenologically revealed 25 instances of bone changes in the pelvis or femurs, occurring in 19 out of 1,363 patients. Of 568 cases in which routine roentgen examinations of the pelvis were made, bone sequelae developed in 3.2 per cent. No bone sequelae were found in 541 male patients treated for carcinoma of the bladder or prostate. Particular attention is directed to the occurrence of aseptic necrosis of the head and neck of the femur and the acetabulum, which occurred in 8 instances. There were 14 cases of fracture of the femoral neck and 3 unusual cases with multiple fractures and sclerosis of the bones of the pelvic girdle. The bone changes seemed to occur more frequently after the introduction of a more intensive type of radiation therapy. Roentgenologically demonstrable lesions in the bones appeared as early as five months and as late as sixty-two months following the radiation treatments. Repeated roentgen examination permitted the demonstration of sclerotic and necrotic changes prior to the development of fracture or frank aseptic necrosis. Irradiation may affect all the bones of the pelvis as well as the neck of the femur. The effects may be multiform, including fractures, sclerosis, osteoporosis and aseptic necrosis of the femoral head.

American Journal of Surgery, New York

67:145-442 (Feb.) 1945. **Partial Index**

Use of Longitudinal Wires in Bones in Treatment of Fractures and Dislocations. G. Murray.—p. 156.
*Phantom Limb Pain: Its Relation to the Treatment of Large Nerves at Time of Amputation. L. G. Herrmann and E. W. Gibbs.—p. 168.
Kinetic Amputations and Plastic Reconstructions of Fingers: Operative Technic and Functional Result. S. P. Bartley.—p. 181.
*Ununited Fractures of Carpal Scaphoid: Preliminary Report on Use of Vitallium Replicas as Replacements After Excision. R. L. Waugh and L. Reuling.—p. 184.
Traumatic Neurocirculatory Disorders of Extremities. J. D. Bisgard. —p. 201.
Transcondylar Fractures of Humerus Treated by Dunlop Traction: Report of 21 Cases. P. D. Allen and A. E. Gramse.—p. 217.
Intervertebral Disks. P. B. Magnuson.—p. 228.
Surgical Approaches for Surgery of Extremities. W. Darrach.—p. 237.
Treatment of Patient with Spinal Cord Injury. J. Raaf.—p. 263.
Penicillin Therapy. W. S. Priest.—p. 280.
De Quervain's Disease: Stenosing Tendovaginitis at Radial Styloid. D. C. Patterson and E. K. Jones.—p. 296.
Reconditioning for War Wounded: United States Army Service Forces Program. A. Thorndike.—p. 302.
Repair of Cranial Defects with Tantalum. F. H. Mayfield and L. A. Levitch.—p. 319.
Compound Fractures Occurring in Army: Factors Influencing Treatment. W. F. Stanek and W. C. Peterson.—p. 333.
Treatment of Fractures in Combat Area. B. M. Bosworth.—p. 342.
Thoracic Injuries. J. Alexander.—p. 360.
Frostbite: Classification and Treatment. G. M. Brownrigg.—p. 370.

Relation of Phantom Limb Pain to Treatment of Nerves at Amputation.—Herrmann and Gibbs studied the phantom limb pain with the primary object of preventing irritation of the afferent pathways in the mixed nerves of the extremity at the time of amputation and during the immediate postoperative period by preventing abnormal scar tissue formation or the formation of neuromas at the site of division of the large nerve trunks. From January 1937 to January 1944 they performed 238 major amputations at the Cincinnati General Hospital and the Christian R. Holmes Hospital of the University of Cincinnati. The large nerve trunks were ligated with nonabsorbable material at a point about 1 inch above the site of amputation. The nerves were never crushed before the ligature was applied. The incidence of phantom limb pain in their series of 120 patients who were adequately studied after a major amputation was only 5.8 per cent. The analysis of the clinical data presented in this study indicates that the treatment of the large nerves at the time of amputation is of considerable importance in preventing the occurrence of phantom limb pain.

Vitallium Replicas of Carpal Scaphoid as Replacements After Excision.—Waugh and Reuling experimented with a replica of vitallium after excision of the fragments in cases of ununited fractures of the carpal scaphoid, in the belief that such a prosthesis would maintain normal relationship of the other bones of the wrist, would prevent radial deviation of the hand and might lessen or prevent the untoward symptoms that frequently follow the ordinary excision operation. The first replica was of solid vitallium and weighed 29 Gm. Although the patient was quite satisfied with the operation and stated that his wrist was much improved, it was believed that the prosthesis was of excessive weight and not a perfect fit. To overcome these difficulties, hollow vitallium replicas were made. The weights of these replicas varied between 12 and 17 Gm. The

average weight of a human carpal scaphoid is between 4 and 5 Gm. While the results to date are encouraging, sufficient length of time has not elapsed to determine whether or not the use of vitallium replicas will be of value in solving the problem of the ununited fracture of the carpal scaphoid.

American Review of Tuberculosis, New York

51:91-204 (Feb.) 1945

Anatomic Studies on Human Tuberculosis: XIII. Incidental Findings of Isolated Tuberculous Foci in Lungs Apart from Primary Complex ("Focal Extension"). K. Terplan.—p. 91.
Id.: XIV. Tuberculous Lesions in Apical and Subapical Field in Connection with Primary Tuberculosis. K. Terplan.—p. 133.
Id.: XV. Restricted Pulmonary Reinfection. K. Terplan.—p. 172.

Anesthesiology, New York

6:1-112 (Jan.) 1945

Incidence, Diagnosis and Management of Coma. E. A. Rovenstine. —p. 1.
Further Studies on Muscular Spasms During General Anesthesia. Experimental Results with Neurotropic Streptococci from Nasopharynges of Patients. E. C. Rosenow, L. H. Mousel and J. S. Lundy.—p. 12.
Anesthesia for Oral Surgery in Presence of Cautery and Diathermy. H. L. Elliot and Julia G. Arrowood.—p. 32.
Anesthesia: XV. A Comparative Study of Liver and Kidney Changes Under Propethylene. W. E. Evans, C. J. Carr and J. C. Krantz. —p. 39.
*Use of Curare in Anesthesia: Review of 100 Cases. F. Cole.—p. 48.
Failure of Procaine to Reverse Cyclopropane-Epinephrine Ventricular Fibrillation. J. W. Stutzman, C. R. Allen and O. S. Orth.—p. 57.
Effect of Anesthesia on Scalp Potential. W. E. Burge.—p. 61.
Recording of Surgical and Anesthetic Data in Two Army General Hospitals: Adaptation of Hollerith Punch Cards Used from July 1, 1941 to December 31, 1943. C. P. Wangeman and S. J. Martin.—p. 64.

Curare in Anesthesia.—In the 100 cases reviewed by Cole, relaxation of abdominal muscles was obtained by curare following anesthetization with a general anesthetic agent, cyclopropane being used in all but 2 cases. To obtain relaxation in 100 abdominal surgical procedures, 158 intravenous injections of curare were given. Single doses varied from 8 mg. to 100 mg.; the largest total dose used was 240 mg. Excellent relaxation was produced in 92 cases. Severe respiratory depression, which occurred in 12 cases, was easily treated by artificial respiration. There were no fatalities attributable to curare. The average interval between the first and second doses in cases requiring more than one dose was 74.8 minutes. In 42.4 per cent of the cases the relaxation obtained from the initial injection persisted throughout the operation and was adequate for closure. Curare can be used by a competent anesthetist in almost every case. It will produce abdominal muscle relaxation during cyclopropane anesthesia without the difficulty, delay or complications of spinal block. Cyclopropane-curare combined anesthesia may well become the method of choice for abdominal surgery.

Archives of Dermatology and Syphilology, Chicago

51:81-161 (Feb.) 1945

Electron Microscope in Dermatology. G. L. Clark, M. B. Baylor, D. E. Martin and G. T. Rafferty.—p. 81.
Chromoblastomycosis: Report of First Case Observed in Canal Zone. J. S. Snow, E. S. Wedding and W. J. Tomlinson.—p. 90.
Nodular Nonsuppurative Panniculitis (Weber-Christian Disease): Preliminary Report of Case Controlled by Sulfapyridine. H. L. Arnold Jr. —p. 94.
Chronic Discoid Lupus Erythematosus with Superimposed Xanthomatous Infiltration: Report of Case. E. W. Netherton.—p. 100.
Alopecia Circumscripta Due to Vitamin A Deficiency: Report of Case. S. Gill.—p. 110.
*Hepatoxic Action of Arsenicals: Effect of Neoarsphenamine and Mapharsen on Cholic Acid Synthesis and Use of Dehydrocholic Acid to Diminsh Hepatotoxic Action of Mapharsen. J. H. Annegers, V. A. Drill, J. Habegger, A. C. Ivy and A. J. Atkinson.—p. 112.
Determination of Macrocytic Anemia Diagnosis of Certain Deficiency Dermatoses. G. V. Stryker and W. A. Halbeisen, with technical assistance of Lucille Leventhal.—p. 116.
American Leishmaniasis: Report of Autochthonous Case. C. D. Stewart and J. F. Pilcher.—p. 124.
Kaposi's Varicelliform Eruption: Extensive Herpes Simplex as a Complication of Eczema. F. W. Lynch, with an addendum by C. A. Evans, V. S. Bolin and R. J. Steves.—p. 129.

Hepatotoxic Action of Arsenicals.—Annegers and his associates attempted to determine whether the intravenous administration of neoarsphenamine and mapharsen affects the synthesis of cholic acid and, if so, whether the oral administration of dehydrocholic acid for three days prior to and after the administration of the arsenicals will diminish the hepatotoxic action of these arsenicals. Dogs with a permanent biliary fistula and a duodenal fistula for the return of bile were used. Neoarsphenamine was given intravenously in a single dose of 300 mg. (60 mg. of arsenic) and mapharsen in a single dose of 60 mg. (17.4 mg. of arsenic). The dose of mapharsen used, on the basis of body weight, is about twice the daily dose used in the intensive five day treatment of syphilis. It was found that a dose of 300 mg. of neoarsphenamine does not consistently depress cholic acid output in dogs with a permanent biliary fistula. Mapharsen in a dose of 60 mg. consistently depresses cholic acid output in biliary fistula dogs deprived of bile acids. Oral administration of dehydrocholic acid may aid in counteracting the hepatotoxic action of mapharsen. It is suggested that patients scheduled to receive intensive arsenotherapy should have the function of their liver examined by one of the more sensitive tests (e. g., the 5 mg. sulfobromophthalein test) and be given a diet known to affect favorably the resistance to poisons for two or three days prior to the initiation of the therapy.

Archives of Internal Medicine, Chicago

75:75-144 (Feb.) 1945

Two Cases of Morvan's Syndrome of Uncertain Cause. H. Parks and O. S. Staples.—p. 75.
Pneumococcic Endocarditis. C. M. Tinsley.—p. 82.
*Bronchiectasis Following Atypical Pneumonia. E. B. Kay.—p. 89.
Determination of Sedimentation Rate of Red Blood Cells. J. T. Peters. —p. 105.
*Adenoma of Islets of Langerhans with Hypoglycemia. H. Walker and W. P. Boger.—p. 109.
Lesions of Muscle in Spirochetal Jaundice (Weil's Disease; Spirochetosis Icterohemorrhagica). W. H. Sheldon.—p. 119.
Vascular Diseases. T. R. Van Dellen, G. W. Scupham, G. de Takats and E. F. Fowler.—p. 125.

Bronchiectasis Following Atypical Pneumonia.—Kay reports that 20 of 45 patients with bronchiectasis developed the condition following attacks of atypical pneumonia. He thinks that this suggests a cause and effect relationship. In an attempt to determine the permanence and extent of the bronchial and bronchiolar damage in the 20 cases of bronchiectasis attributable to atypical pneumonia, bronchography was repeated over a period of two to six months. In only 3 instances did bronchiectatic bronchi resume their normal contour and show evidence of clearing. The bronchiectasis of the remaining 17 patients appeared to be permanent. Ten of these 17 patients have had lobectomies. The interval between the atypical pneumonia and the operation varied from six to thirteen months. The bronchiectatic damage in the resected lobes substantiated the permanence of the bronchial destruction. The author presents 7 of the 17 case histories in which bronchiectasis followed attacks of atypical pneumonia. Their attacks of pneumonia were prolonged. Continuance of a productive cough and x-ray evidence of pulmonary pathologic conditions led to bronchographic examination and establishment of the diagnosis of bronchiectasis. Continued rest in bed should be insisted on until all evidence of pulmonary infection has disappeared. When atypical pneumonia runs a protracted course, and particularly when it is associated with x-ray evidence of unrelieved atelectasis, measures should be taken to relieve the bronchial obstruction and atelectasis. Such agents would consist of expectorants, steam and menthol inhalations and postural drainage. If these fail, bronchoscopic aspiration should be done, at which time the edematous ulcerated membrane could be shrunken with epinephrine hydrochloride. If the productive cough persists, bronchiectasis should be suspected and bronchograms should be made. Twenty-one of the entire group of 45 patients with bronchiectasis have had lobectomies, with complete relief of symptoms. There was no operative mortality.

Hypoglycemia in Adenoma of Islets of Langerhans.—Walker and Boger state that small adenomas of the islets of Langerhans produce recurrent severe hypoglycemic reactions, which at first yield to progressive increases of the intake of carbohydrates but are finally cured only by the surgical removal of the adenoma. The authors report 2 cases of adenoma of the islets of Langerhans in which the tumors were removed surgically, with successful control after operation. The patients were

women aged 24 and 67. Though there are fairly frequent reports of islet tumors, the removal of an adenoma with recovery is still relatively rare. With the reported 2 cases the number of operative cures of pancreatic adenoma is raised to 56. The symptoms produced by these tumors are those of "insulin shock." Headache, weakness, dizziness, nausea, sweating, tachycardia, hypothermia, lowering of the blood pressure and diplopia are common. Neurologic signs and symptoms may be encountered alone or in any combination. The frequency of a positive Babinski sign, which disappears on the relief of hypoglycemia, is worthy of comment. Hunger has been emphasized in many reports, but both of the described cases illustrate the fact that it is not a universal symptom. Convulsions are common. The lack of correlation between the occurrence of symptoms and the level of sugar in the blood has not been explained. The authors believe that the study of this condition will be furthered if more attention is paid to the alterations produced in the other endocrine glands. Surgical removal of these tumors is the most effective therapy, and this treatment is imperative in order to prevent damage to the central nervous system as a result of long-standing hypoglycemia.

Archives of Surgery, Chicago

50:1-62 (Jan.) 1945

Orientation to Mechanisms of Clinical Shock. E. A. Stead Jr. and J. V. Warren.—p. 1.
Arteriovenous Fistula Between Right Common Iliac Artery and Inferior Vena Cava: Report of Case of Its Occurrence Following Operation for Ruptured Intervertebral Disk with Cure by Operation. R. R. Linton and P. D. White.—p. 6.
Traumatic Hemothorax: Decortication in Treatment of Chronic Uninfected Type. F. P. Coleman.—p. 14.
Slipping of Upper Femoral Epiphysis: Diagnostic and Therapeutic Considerations. W. T. Green.—p. 19.
*Evaluation of Gelatin and Pectin Solutions as Substitutes for Plasma in Treatment of Shock: Histologic Changes Produced in Human Beings. H. Popper, B. W. Volk, K. A. Meyer, D. D. Kozoll and F. Steigmann.—p. 34.
Malignant Renal Neoplasms: Clinical and Pathologic Study. B. S. Abeshouse and T. Weinberg.—p. 45.
*Ligation of Femoral Vein for Chronic Occlusive Arterial Disease: Review of 118 Ligations. S. T. Glasser.—p. 56.

Gelatin and Pectin Solutions as Substitutes for Plasma in Treatment of Shock.—Popper and his associates report the results of intravenous administration of 257 liters of gelatin solution to 162 patients in 213 individual infusions. The quantity of solution administered ranged from a total of 1 to 10 liters per patient. Pectin solution was administered in the amount of 235 liters to 155 patients in 251 individual infusions for a total of from 1 to 9 liters per patient. About half of the patients were hospital control subjects; the other half were patients with various degrees of surgical, traumatic, hemorrhagic and medical shock. It was found that the two solutions produce an equal degree of hemodilution, which levels off with administration of higher doses of both solutions. This leveling off is more pronounced in patients with anemia and hypoproteinemia. A hypothesis is suggested that the hemodilution is started by the macromolecular solution but is maintained by other substances, possibly labile plasma proteins. Gelatin and pectin solutions produce an equal rise in the sedimentation rate, which is considered an index of hematologic changes. The difference between the two solutions lies in the fact that gelatin produces less change in the tissues. After administration of amounts of pectin in excess of those used for patients in shock, splenomegaly and deposition of a peculiar material in various organs may be observed. It is found in phagocytic cells, capillaries, tissue spaces and infiltrating reticulum fibers in the spleen, kidneys, liver and lungs; it resembles deposits of amyloid and causes a reaction of the reticuloendothelial cells. A similar picture was produced in animals by administration of large amounts of pectin. The clinical significance of these changes is unknown. Since the beneficial effects of gelatin and pectin appear equal on the basis of changes in the tissues, gelatin appears preferable to pectin.

Ligation of Femoral Vein for Chronic Occlusive Arterial Disease.—Glasser reports the results of 118 ligations of the femoral vein performed on 110 patients. The superficial femoral vein was interrupted immediately distal to its junction with the vena profunda. Transfixation of the cut ends of the vein is a safeguard against slipping of the ligature. In order to determine indications for the procedure and a proper selection of cases, ligation of the femoral vein was performed on all patients with chronic obstructive arterial disease who consented to the operation. Eighty-eight of the 110 patients were admitted with active lesions on the toes; this showed that the greatest number of patients were treated after the phase in which ligation of the femoral vein might be considered prophylactic. At the time of the final follow-up examination, 25.4 per cent of the entire series were alive. The author concludes that his experience definitely places ligation of the femoral vein in the armamentarium for the treatment of chronic occlusive arterial disease. He considers it indicated for prophylaxis in chronic obstructive arterial disease—before such lesions as gangrene, ulceration and infection present themselves.

Bulletin of Johns Hopkins Hospital, Baltimore

75:327-452 (Dec.) 1944

*Acute Syphilitic Meningitis Treated with Penicillin. R. A. Nelson and L. Duncan.—p. 327.
Tryptophan Requirement of Man as Determined by Nitrogen Balance and by Excretion of Tryptophan in Urine. L. E. Holt Jr., A. A. Albanese, Jane E. Frankston and Virginia Irby.—p. 353.
Chorionic Gonadotropin and P egnandiol Values in Normal Pregnancy. G. E. S. Jones, E. Delfs and H. M. Stran.—p. 359.
Studies on Common Pathogenic Fungi and on Actinomyces Bovis: I. In Vitro Effect of Fatty Acids. E. L. Keeney, L. Ajello and Elsie Lankford.—p. 377.
Id.: II. In Vitro Effect of Sulfonamides. E. L. Keeney, L. Ajello and Elsie Lankford.—p. 393.
Id.: III. In Vitro Effect of Penicillin. E. L. Keeney, L. Ajello and Elsie Lankford.—p. 410.
Propionate and Undecylenate Ointments in Treatment of Tinea Pedis and In Vitro Comparison of Their Fungistatic and Antibacterial Effects with Other Ointments. E. L. Keeney, L. Ajello, E. N. Broyles and Elsie Lankford.—p. 417.

Penicillin in Acute Syphilitic Meningitis.—Nelson and Duncan describe the effect of sodium penicillin in cases of acute syphilitic meningitis treated at the Johns Hopkins Hospital. The route of administration was intramuscular. Dosage and duration of treatment were variable, but no other treatment was given with or after penicillin. At the time this report was written from 98 to 310 days had elapsed since the penicillin treatment. The immediate results were excellent. Although penicillin did not appear in the cerebrospinal fluid even after frequent intramuscular administration, the drug was effective. None of the 10 patients treated have thus far developed evidence of clinical relapse, though 1 has shown relapse in the spinal fluid findings. The total amount of penicillin administered varied from 600,000 to 4,000,000 units; the duration of treatment varied from seven and one-half to eleven days. The treatment schedule advised for acute syphilitic meningitis is a total dose of 2,000,000 to 3,000,000 Oxford units of penicillin administered every three to four hours day and night for from eight to sixteen days. The authors think that intravenous administration of penicillin is relatively ineffective and intrathecal administration is unnecessary. All patients with acute syphilitic meningitis treated with penicillin should be closely followed, at least as often as every three months during the first year after treatment, every six months for another two to three years, and yearly thereafter. It should not be forgotten that, although symptomatic (and often serologic) improvement can be secured in acute syphilitic meningitis with almost any form of modern chemotherapy or fever therapy, the eventual prognosis of this condition in terms of development of late neurosyphilis, especially dementia paralytica and tabes, is grave.

Bull. of the U. S. Army Med. Dept., Washington, D. C.

85:1-120 (Feb.) 1945

Early Management of Wounds of Hand. W. Cutler Jr.—p. 92.
Gastrointestinal Outpatient Service. M. Magnes.—p. 99.
Adjusting Emotionally Unstable Soldier. S. A. Sandler and S. R. Rotman.—p. 103.
*Verification Tests in Serodiagnosis of Syphilis. C. R. Rein and G. R. Callender.—p. 108.
Dental Study of U. S. Soldiers in the Tropics. H. B. Zeitlin.—p. 113.

Verification Tests in Serodiagnosis of Syphilis.—Rein and Callender point out that technical false positive reactions occur in serums containing no antibody and may be due to technical errors in collecting and labeling specimens, the use

of contaminated and hemolyzed specimens, laboratory errors in performing the tests, the use of faulty materials and reagents, or errors in recording or reporting the final results. Biologic false positive reactions may be due to the presence of antibody-like substances similar to the antibodies produced in syphilitic disease, an increase or alteration of the seroglobulin fraction, or an increase or alteration of some chemical substance or substances in the blood. Stokes has enumerated about thirty conditions which render frequent, occasional or disputed biologically false positive serologic reactions. Investigations at the Army Medical School have disclosed still other diseases and conditions which may cause false positive serologic reactions. Any metabolic disturbance or febrile episode may at times influence the reliability of serodiagnostic tests for syphilis. There is need for a method which will differentiate the false from the true reactions. Several "verification" or "confirmation" procedures have been proposed for this purpose, but none of these have been able to distinguish consistently between true and false positive serologic reactions. Until a more reliable verification test has been developed, the diagnosis of a syphilitic infection should not be made on the basis of the results obtained with the various serodiagnostic tests and verification procedure alone. The final diagnosis should depend on the ensemble of the available data, including (1) a detailed history, (2) a complete physical examination, (3) radiologic examinations of the heart and aorta, (4) a spinal fluid examination, (5) examination of contacts, marital partners, brothers, and sisters and (6) repeated serologic examinations in the same and other laboratories. Additional laboratory examinations should be made, including blood counts, blood smears, heterophil antibody tests, sedimentation rates, specific complement fixation, precipitation and agglutination tests and albumin-globulin ratio studies.

Cancer Research, Baltimore

5:65-128 (Feb.) 1945

Mouse Leukemia: XII. Role of Genes in Spontaneous Cases. E. C. MacDowell, J. S. Potter and M. J. Taylor.—p. 65.
*Inheritance of Cancer in Mice, with Special Reference to Mammary Carcinoma. E. W. Miller and F. C. Pybus.—p. 84.
*Effect of Foster Nursing on Incidence of Spontaneous Mammary Carcinoma in Two Inbred Strains of Mice. E. W. Miller and F. C. Pybus.—p. 94.
Further Studies on Quantitative Determination of Growth of Transplantable Mouse Adenocarcinoma. M. C. Reinhard, H. L. Goltz and S. G. Warner.—p. 102.
Effect of Colchicine and X-Rays on Onion Root Tips. M. Levine. p. 107.

Inheritance of Cancer in Mice.—Miller and Pybus describe investigations on the incidence of mammary carcinoma in a series of crosses and backcrosses between Simpson (high tumor) and Edinburgh (low tumor) and between Simpson and CBA (low tumor) strains of mice. The results confirm the existence of a maternal extrachromosomal factor for mammary carcinoma discovered by previous workers and also show that an important part is played by interstrain genetic differences in susceptibility. No extrachromosomal factor was observed in the inheritance of lung tumors, hepatomas or bone tumors, while the evidence was inconclusive in the case of lymphadenopathy.

Effect of Foster Nursing on Incidence of Mammary Carcinoma in Inbred Mice.—Miller and Pybus show that when females of the Simpson (high mammary tumor) strain were fostered by mice of Strong's CBA (low mammary tumor) strain the incidence was reduced from 69.5 per cent to 55 per cent. There was unavoidable delay in fostering some of the litters, and even some of those fostered within twenty-four hours after birth had probably been suckled by their own mothers. There were fewer mammary tumors in the offspring of the fostered Simpson mice, partly because of a greatly increased mortality from lymphadenopathy. The offspring of fostered tumorous females had a higher tumor incidence than the young of fostered nontumorous mice. The mammary tumor incidence in CBA females fostered by Simpson mice was raised from 5 per cent to an average of 44.4 per cent. The CBA fostered females were able to absorb the milk influence and transmit it to their offspring even when they themselves died nontumorous. There was a great increase in lymphadenopathy in fostered Simpson mice and their offspring; there was also an increase in the disease in fostered CBA mice and their descendants. Fostering had no effect on the incidence either of lung adenomas or of hepatomas. When young CBA mice had spent from six to twelve days with their own mothers before being fostered to Simpson females they were no longer susceptible to the action of the milk influence, although they were able to transmit it to their young.

Endocrinology, Springfield, Ill.

36:77-180 (Feb.) 1945

Concerning Hypersensitivity of Adrenalectomized Rats to Vascular Stress. O. Hechter.—p. 77.
Time Relationships of Deciduomata Formation in Prolactin Treated and Normal Pseudopregnant Rats. K. L. Sydnor.—p. 88.
Demonstration of Cyclic Change in Histochemistry of Kidney Synchronized with Estrous Cycle in Rat. K. A. Oster, with technical assistance of J. G. Baum.—p. 92.
Influence of Thiourea on Plasma Proteins and Organ Weights in Rat. J. H. Leathem.—p. 98.
Estrogen Activity in Eviscerated Rat. Clara M. Szego and S. Roberts. —p. 104.
Comparative Effects of Progesterone, Estradiol, Diethylstilbestrol and Its Monomethyl Ether on Early Blastocyst of Rabbit. N. T. Werthessen, S. L. Gargill, S. Berman and B. Greenberg.—p. 110.
Cause of Abnormal Retention of Ingested Water in Adrenalectomized Rats. R. A. Shipley.—p. 118.
Innervation of Avian Hypophysis. G. A. Drager.—p. 124.
Effects of Bilateral Cervical Sympathectomy on Thyroid Activity. G. H. Lowe Jr., A. C. Ivy and S. Brock.—p. 130.
Collection and Loss of Radioactive Iodine Compared with Anatomic Changes Induced in Thyroid of Chick by Injection of Thyrotropic Hormone. F. R. Keating Jr., R. W. Rawson, W. Peacock and R. D. Evans.—p. 137.
Comparison of Effect of Thiouracil and of Injected Thyrotropic Hormone on Collection of Radioactive Iodine and Anatomic Changes Induced in Thyroid of Chick. R. A. Larson, F. R. Keating Jr., W. Peacock and R. W. Rawson.—p. 149.
Effect of Thiouracil on Collection of Radioactive Iodine by Thyroid of Chick. R. A. Larson, F. R. Keating Jr., W. Peacock and R. W. Rawson.—p. 160.
Effect of Dietary Protein on Adrenal Weights and on Growth After Unilateral Adrenalectomy. R. S. Benua and E. Howard.—p. 170.

Gastroenterology, Baltimore

4:1-120 (Jan.) 1945

Application of Sulfonamides to Gastrointestinal Disease: I. Action of Sulfonamides in Gastrointestinal Disease. A. H. Aaron and E. M. Farber.—p. 1.
Id.: II. Gastric Excretion of Sulfonamides in Man. L. Schiff.—p. 3.
Id.: III. Clinical Use of Succinylsulfathiazole in Chronic Ulcerative Colitis. H. M. Pollard.—p. 4.
Id.: IV. Late Results in Ulcerative Colitis. E. N. Collins.—p. 8.
Id.: V. Use of Sulfonamides in Ileitis. B. B. Crohn.—p. 11.
Id.: VI. Sulfonamide Therapy in Biliary Tract Disease. M. E. Rehfuss.—p. 13.
Id.: VII. Effects of Sulfonamides in Bacillary Dysentery. J. Felsen. —p. 14.
Isolated Sarcoidosis of Small Intestine Simulating Nonspecific Ileojejunitis. C. J. Watson, L. G. Rigler, O. H. Wangensteen and J. S. McCartney.—p. 30.
*Simulation of Chronic Bacterial Dysentery by Paratyphoid B Infection. D. N. Silverman and A. Leslie.—p. 53.
Gastrointestinal Disease in Relation to Occupational Hazards. I. Gray. —p. 61.
Metabolic Disturbances in Workers Exposed to Trinitrotoluene. L. C. McGee, A. McCausland, J. F. Preston Jr. and L. A. Houff.—p. 72.
External Pancreatic Secretion in Cases of Duodenal Ulcer. M. W. Comfort and A. E. Osterberg, with technical assistance of Elizabeth Maclay.—p. 85.
Influence of Hemorrhage and of Depletion of Plasma Proteins on Intestinal Activity. K. G. Wakim and J. W. Mason.—p. 92.

Simulation of Chronic Bacillary Dysentery by Paratyphoid B Infection.—Silverman and Leslie have observed during the past twenty years 1,000 cases of bacteriologically proved cases of bacillary dysentery. In the original series of cases the causative organism proved to be the Flexner bacillus. In subsequent reports in 1932 and 1943 numerous sporadic cases of chronic bacillary dysentery due to the lactose fermenter of Duval have been described. Others were due to many different strains of the dysentery organism. Only during the past year has bacteriologic investigation of chronic intestinal infections revealed in some instances the presence of Salmonella paratyphi B as the only apparent pathogen. The symptomatology and physical findings in these cases of "chronic dysentery" caused by S. paratyphi B have been identical with those in true chronic bacillary dysentery and totally dissimilar to the picture

of classic paratyphoid fever. This resemblance is more than superficial; there is parallelism in the roentgenographic, proctoscopic and immunologic features. The authors report 4 cases in which chronic bacillary dysentery was suspected. One of these actually was a case of chronic bacillary dysentery (Shiga). The other three proved to be caused by S. paratyphi B. of identical strain proved culturally and by cross agglutination. This is the first report of chronic intestinal infection simulating chronic dysentery caused by S. paratyphi B. The writers are at a loss to explain this apparently sudden appearance of Salmonella paratyphi B in the ranks of the etiologic agents of chronic intestinal infection.

Journal of Allergy, St. Louis

16:1-60 (Jan.) 1945

*Endocrine Allergy: I. Allergic Sensitivity to Endogenous Hormones. B. Zondek and Y. M. Bromberg.—p. 1.
*Blood Studies in Allergy: III. Cellular Reactions in Sulfonamide Sensitivity. T. G. Randolph and F. F. A. Rawling.—p. 17.
Study of Asthmatics Returned from Overseas. H. C. Leopold.—p. 30.
Evaluation of Histamine Intradermal Test as General Indicator of Allergy. L. Farmer.—p. 44.
Seasonal Dermatitis Due to Albumin Fraction of Timothy Pollen. J. H. Mitchell and W. F. Mitchell.—p. 48.
Allergic Dermatitis Due to Metallic Cobalt. L. Schwartz, S. M. Peck, K. E. Blair and K. E. Markuson.—p. 51.

Endocrine Allergy.—Zondek and Bromberg believe that allergic reactions may be due to endogenous allergens produced by endocrine glands. They designate this condition "endocrine allergy." In certain pathologic conditions related to the menstrual cycle or the menopause, skin reagins to the steroid hormones—estrone, estradiol, progesterone, pregnandiol, testosterone, androsterone or desoxycorticosterone acetate—can be demonstrated by cutaneous tests. Analogous conditions of sensitivity to insulin and chorionic gonadotropin may occur. Allegic endocrine hypersensitiveness may also be demonstrated by the "recurrent test," i. e. by the appearance of a local reaction at the site of a first intracutaneous test, following a subcutaneous injection twenty-four hours later of the allergenic hormone at a new site. When the cutaneous reaction in cases of endocrine allergy is delayed, it often occurs in the premenstruum, viz. at a time coincident with the attainment of maximum hormone level ("retarded test reaction"). Normal subjects injected intracutaneously with serum of patients hypersensitive to estrone yielded positive cutaneous reactions when a solution of estrone was given subsequently at the site of the former serum injection (positive Prausnitz-Kuestner test). Serum of patients hypersensitive to estrone may also cause positive cutaneous reactions in normal subjects; this occurs when the concentration of hormonal allergen in the normal subject reaches high values (either physiologically or following injection). The reagins induced by hormonal allergens are similar to those of allergic reagins in general. Personal and family histories of allergy and high blood eosinophilia are frequent in persons with positive cutaneous tests. Favorable results from desensitization also prove that the disturbances are caused by endocrine allergy. Allergy to endogenous hormones has been observed in women with disorders related to menstruation or the menopause. Pruritus vulvae and various premenstrual disorders may be conditioned by allergy to endogenous hormones. This is also true of asthma, vasomotor rhinitis, angioneurotic edema and urticaria when they are related to menstruation or the menopause.

Cellular Reactions in Sulfonamide Sensitivity.—Randolph and Rawling studied the blood response following trial ingestion of a sulfonamide drug in 3 patients of known sulfonamide sensitivity. Total and differential leukocyte counts were made prior to and at frequent intervals for as long as ten days following the oral administration of a test dose. A white blood cell diluting fluid consisting of phloxine and methylene blue dissolved in equal parts of propylene glycol and water was employed. This technic permits the counting chamber differentiation of eosinophils, polymorphonuclear leukocytes and mononuclear leukocytes in the same specimen on which the total leukocyte count is determined. Differential counts of 100 cells in the counting chamber and 200 cells from the Wright stained film were made at each observation. The authors observed an initial diminution in total leukocytes and eosinophils; this was followed by an increase in leukocytes, which was due in part to the presence of young myeloid cells. After the constitutional symptoms had subsided, the eosinophils either returned to the preingestion count or showed an increase above that level. The clinical and hematologic response in these cases supports the thesis that an allergic mechanism is responsible.

Journal of Neuropath. & Exper. Neurology, Baltimore

4:1-98 (Jan.) 1945

Vascular Changes in Experimental Anaphylaxis of Brain. A. Ferraro.—p. 1.
Encephalitis Affecting Basal Ganglions in Monkeys. R. B. Richter.—p. 16.
Encephalotrigeminal Angiomatosis. J. R. Green.—p. 27.
Porencephaly: II. Studies in Phlebothrombosis and Phlebostasis. O. Marburg, P. R. Rezek and M. B. Marks.—p. 43.
Effects of Lesions of Visual System on Photic Driving. J. I. Woolf, A. E. Walker, G. W. Knox and W. C. Halstead.—p. 59.
Central Nervous System in Porphyria. A. B. Baker and C. J. Watson.—p. 68.
Cerebral Thromboangiitis Obliterans and Its Relation to Periarteritis Nodosa. I. M. Scheinker.—p. 77.
Case of Periarteritis Nodosa with Decerebrate Rigidity and Extensive Encephalomalacia in 5 Year Old Child. N. Malamud.—p. 88.
New Method for Impregnation of Oligodendroglia and Microglia in Ordinary Necropsy Material. A. Griño.—p. 93.

Journal of Neurophysiology, Springfield, Ill.

8:1-74 (Jan.) 1945

Degree and Nature of Regeneration of Splanchnic Innervation to Adrenal Gland Two Years Following Complete Bilateral Sympathectomy in Dogs. J. W. Papez, A. V. Jensen and H. H. Dukes.—p. 1.
Restoration of Vision After Crossing of Optic Nerves and After Contralateral Transplantation of Eye. R. W. Sperry.—p. 15.
Observations of Gas Bubbles in Pial Vessels of Cats Following Rapid Decompression from High Pressure Atmospheres. C. E. Wagner.—p. 29.
Propagation of Spreading Cortical Depression. A. A. P. Leão and R. S. Morison.—p. 33.
Influence of Depletion of Diffusible Electrolytes on Electrical Activity of Brain. E. P. Pick and M. M. Miller.—p. 47.
Functional Organization of Giant Fiber System of Lumbricus. T. H. Bullock.—p. 55.

Journal of Neurosurgery, Springfield, Ill.

2:1-77 (Jan.) 1945

Intracranial Fibrosarcomas of Dura Mater in Childhood: Pathologic Characteristics and Surgical Management. O. T. Bailey and F. D. Ingraham.—p. 1.
Giant Cell Tumor of Sphenoid Bone: Report of Case. D. H. Echols.—p. 16.
*Technic of Tantalum Plating of Skull Defects. A. J. Hemberger, B. B. Whitcomb and B. Woodhall.—p. 21.
Functional and Structural Changes in Monkey's Brain During and After Concussion. R. A. Groat, W. F. Windle and H. W. Magoun.—p. 26.
Post-Traumatic Vertigo and Dizziness. A. P. Friedman, C. Brenner and D. Denny-Brown.—p. 36.
Exanopic Central Scotoma, a Pitfall in Diagnosis. A. D. Ecker and E. W. Anthony.—p. 47.
*Nerve Grafts: Importance of Adequate Blood Supply. I. M. Tarlov and J. A. Epstein.—p. 49.
Radiographic Visualization of Intracerebral Dermoid Cyst. S. W. Gross.—p. 72.

Tantalum Plating of Skull Defects.—Hemberger and his associates point out that the strength, malleability and inertness of tantalum in tissue have recommended its use in the repair of skull defects. This report is concerned with the operative technics that have evolved during the repair of 42 skull defects. In the first 6 cases small plates were inserted in the skull defects without fixation. They were preformed and altered to fit at the operating table or formed at the operating table from sheets of 0.015 inch tantalum plate. After the defect had been exposed, its edges were smoothed and a ledge was chiseled out of the outer table of the skull. The fitted tantalum plate was laid on this ledge without further support. In the sixth case a tantalum plate was inserted with this simple technic. Fourteen days after the operation, roentgenography of the skull showed that the plate had slipped. In 6 other cases fixation of the plate was secured by wiring the plate through drill holes in the plate and skull with number 30 tantalum wire. In the remaining 30 cases of this series preformed molding and inlay fixation with tantalum points have provided an adequate restoration of skull contour.

Nerve Grafts: Importance of Blood Supply.—In order to test the importance of the vascular supply of nerve grafts in governing their take, Tarlov and Epstein undertook studies in dogs to determine the manner of revascularization of nerve grafts and then attempts were made to improve the vascular supply of the grafts by the application of pedicled muscle or fat-areolar tissue flaps to them. The authors conclude that very good recovery of sensory and motor function may follow the introduction of fresh homologous cadaver grafts into sciatic nerve defects in dogs. Adequate vascularization is a most important factor in a nerve graft. Necrosis of a graft may occur if blood vessels are prevented from entering it. There is no justification for the practice of interposing an impermeable membrane between the graft and the surrounding tissue. Although it is imperative that the bed for a nerve graft consist of well vascularized tissue, it has proved futile to attempt to increase the blood supply of nerve grafts by the application of fat-areolar tissue or muscle flaps to them or by tunneling the grafts through muscle. When cable grafts are used, its strands should be bound together with plasma only at their ends so that the intervening segments may be separated in the bed of the graft in order that they may more readily acquire an adequate blood supply. The use of plasma clot is essential for suturing cable grafts, since considerable damage accompanies the use of thread suture. Better unions are obtainable with the plasma clot technic.

New England Journal of Medicine, Boston

232:121-148 (Feb. 1) 1945

Use of the Term "Psychoneurosis." J. M. Thomas.—p.121.
Quantitative Serologic Tests for Syphilis. A. Heyman.—p. 124.
Chronic Monarticular Arthritis. J. G. Kuhns.—p. 128.
*Effect of Penicillin on Inoculation Malaria: Negative Report. J. A. Hindle, A. S. Rose, L. D. Trevett and C. Prout.—p. 133.
Orthopedic Surgery: Problem of Intervertebral Disk. C. B. Larson. —p. 137.

Negative Effect of Penicillin on Inoculation Malaria.—Twenty-eight patients who had cerebrospinal syphilis were treated with penicillin and benign tertian malaria. Penicillin was administered intramuscularly, 50,000 Oxford units being given every four hours for ten days, a total of 3,000,000 units. Therapeutic malaria was induced by Plasmodium vivax. A calculated standard inoculum of 500,000 parasites, taken from an active case, was injected intravenously. It was found that penicillin does not suppress fever or the parasite count of active inoculation malaria and that when given before or at the time of the malaria inoculation it does not prevent or postpone the development of fever and parasitemia. It is reasoned that since penicillin does not have an antimalarial effect on inoculation Plasmodium vivax malaria it will not be effective in other types of malaria or in naturally acquired malaria.

New York State Journal of Medicine, New York

3:225-336 (Feb. 1) 1945

Place of Mass Survey in Tuberculosis Control Program. H. R. Edwards. —p. 269.
*Further Observations on One Day Treatment of Syphilis with Fever and Mapharsen. N. Jones, J. L. Hundley, A. E. Walker, C. M. Carpenter, S. L. Warren and H. Hanson.—p. 277.
Evaluation of Certain Educational Procedures in Program for Control of Venereal Disease. C. M. Carpenter, M. E. Winchester and A. Gourdin.—p. 281.
Utility of Directional Needle in Spinal Anesthesia. S. J. Sarnoff and E. A. Rovenstine.—p. 286.
Subtotal Gastrectomy in Medically Resistant Ulcers. J. W. Hinton. —p. 291.

One Day Treatment of Syphilis with Fever and Mapharsen.—Jones and his associates report extended observations on the original group of 280 patients for a period of eight months and include data on the treatment of an additional 141 patients observed for a minimum period of three months. Patients selected for the study are those with clinical evidence of early syphilis who deny previous antisyphilitic treatment. The diagnosis is verified by dark field and serologic examinations. Contraindications to this type of therapy are active pulmonary tuberculosis, heart disease, renal disease, peripheral vascular disease and extreme obesity. The majority of the patients treated were in the age group from 15 to 24 years. Three different therapeutic schedules were used. With schedule A, mapharsen in the amount of 1 mg. per kilogram of body weight is administered during the induction of fever, but before the temperature reached 103 F. In schedule B, mapharsen in the amount of 1 mg. per kilogram of body weight is injected intravenously in the evening, and fever therapy is carried out the following day. A second injection of 1.5 mg. of mapharsen per kilogram of body weight is given at the termination of the fever. In schedule C, mapharsen in the amount of 2 mg. per kilogram of body weight is given at the termination of the fever. Better results have been obtained with schedules B and C, in which larger amounts of mapharsen (2.5 and 2.0 mg. respectively per kilogram of body weight) were employed than with schedule A. The authors think that this mode of therapy compares favorably with other forms of intensive therapy for early syphilis.

Northwest Medicine, Seattle

44:35-70 (Feb.) 1945

*Common Cold Not Caused by Virus. E. E. Brown.—p. 39.
Medical Education in Portland, 1919-1944. W. C. Hunter.—p. 42.
Menopause and Its Management. W. H. Orr.—p. 47.
Arthritis: Plans of Therapy. C. P. Wilson.—p. 51.
Results of Early Rising Following Appendectomy. L. Patricelli.—p. 54.

Common Cold Not Caused by Virus.—Brown points out that the striking reduction in colds following the prophylactic administration of sulfadiazine in daily small doses to hundreds of thousands of service men throws doubt on the virus origin of the common cold, because the sulfonamides admittedly are valueless in virus diseases. He thinks that the common cold is not a single entity due invariably to a virus but that by far the most common cause is the hemolytic streptococcus. Such colds are mainly acute exacerbations of chronic sinusitis and usually follow chilling. They are accompanied by dissociation of the ubiquitous Streptococcus viridans. The bacteriostatic action of daily doses of sulfadiazine probably prevents conversion of the viridans into the hemolytic streptococcus. Colds of virus origin and those due to allergy are much less frequent. Two strong arguments exist against the virus etiology of the frequently recurring cold: (1) the long period of immunity known to exist following virus colds and (2) the striking reduction in the incidence of colds in patients taking prophylactic daily doses of sulfonamides. If the common type of cold that follows chilling was due to a virus, the virus would have to be a resident of the upper respiratory tract of large populations who develop colds simultaneously during chilling weather. Such a virus has not been found; the streptococcus has.

Ohio State Medical Journal, Columbus

41:101-200 (Feb.) 1945

Cirrhosis of Liver. A. C. Ivy.—p. 125.
Study of Headaches and Vertigo and Their Correlations to Derangement of Sexual Function. I. Mason.—p. 132.
Diarrhea of Newborn: Report of Epidemic. F. Meola.—p. 137.
Juvenile Delinquency. D. E. Donley.—p. 139.
Sulfonamide Treatment of Gonorrhea: Some Factors Affecting Its Efficiency. H. E. Christman.—p. 142.
Current Thinking in Field of Allergy. J. Forman.—p. 144.
Reconstruction of Common Duct by Means of Vitallium Tube. E. Sternfeld and W. H. Mcelley.—p. 146.
Pneumococcal Lobar Pneumonia Associated with Megakaryocytic and Leukoblastic Hyperplasia. J. L. Orbison and T. C. Laipply.—p. 148.

Rhode Island Medical Journal, Providence

28:1-76 (Jan.) 1945

What of the Doctor-Veteran? A. H. Jackvony.—p. 13.
Public Health Aspects of Rheumatic Fever. J. R. Paul.—p. 15.
How Can We Avoid Renal Complications of Sulfadiazine Therapy. A. M. Burgess, E. S. Wing, L. I. Kramer and R. O. Bowman.—p. 18.
Centenary Celebration of Horace Wells, 1844-1944. A. H. Lynch. —p. 26.

28:77-156 (Feb.) 1945

Diagnostic and Therapeutic Considerations in Anterior Poliomyelitis. W. T. Green.—p. 89.
Correction of Speech and Reading Difficulties. E. M. Cole.—p. 94.
Practical Approach to Universal Dental Problem. H. S. Dwyer.—p. 102.
Integrity of Mind and Purpose. B. Earl.—p. 108.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Industrial Medicine, London

1:207-270 (Oct.) 1944

Toxic Effects of Ethylene Chlorohydrin. M. W. Goldblatt and W. E. Chiesman.—p. 207.
Mean Intelligence Scores of Random Sample of Occupations. H. T. Himmelweit and J. W. Whitfield.—p. 224.
Toxic Polyneuritis Arising During Manufacture of Tricresyl Phosphate. D. Hunter, K. M. A. Perry and R. B. Evans.—p. 227.
Ancillary Health Services in Industry. R. E. Lane.—p. 232.
Gynecomastia in Stilbestrol Workers. M. Patricia Fitzsimons.—p. 235.
*Investigation for Signs of Benzene Intoxication in Workers Using Airplane Dope and Rubber Solvents. D. Hunter, R. Milton and K. M. A. Perry, H. J. Barrie, J. F. Loutit and T. S. Marshall.—p. 238.
Disease of Lungs in Boiler Scalers, with Case Report and Review of Literature. H. E. Harding, D. L. McRae Tod and A. I. G. McLaughlin.—p. 247.

Benzene Intoxication from Airplane Dope and Rubber Solvents.—Hunter and his associates studied the evidence of benzene poisoning in workers handling airplane dope and the rubber solvents used in covering self-sealing gasoline tanks. These substances contain benzene in variable quantities. The amount of benzene in airplane dope does not exceed 15 per cent. In the case of the industrial rubber solvents the amount of aromatic hydrocarbons is not more than 5 per cent. Inquiries in regard to age, length of present employment, type of previous occupation and symptoms were made of hundreds of women and men who worked in dope shops. Persons working in the same shops but not exposed to dope were examined and served as controls. It was found that the concentration of benzene in the atmosphere of dope shops and factories using rubber solvents did not approach toxic levels. Blood counts of workers in these factories were not significantly different from counts in a control group. No material change was found in the inorganic-total sulfate ratio in the urine of the workers. It is emphasized that, in the absence of estimations of atmosphere concentrations of benzene, blood changes alone cannot be accepted as evidence of benzene intoxication.

British Journal of Ophthalmology, London

29:1-56 (Jan.) 1945

*Injuries to Eyes or to Intracranial Visual Paths in Air Raid Casualties Admitted to Hospital. P. M. Blake.—p. 1.
Central Ophthalmologic Institute for United Nations. A. Loewenstein.—p. 6.
Eye of West African Negro. J. G. Scott.—p. 12.
Eye Diseases in the East. J. Minton.—p. 19.
Ophthalmic Work in British General Hospital in North Africa. A. J. Cameron.—p. 26.
Some Observations on Tendency to Near-Point Esophoria, and Possible Contributory Factors. D. D. S. Stewart.—p. 37.
*Head Injuries from Ophthalmologist's Viewpoint. A. D. Ecker and E. W. Anthony.—p. 43.
Transparency of Lens Following Traumatic Cataract. H. J. Stern.—p. 48.

Injuries to Eyes in Air Raids.—Blake reviews observations on eye injuries sustained by people in twelve air raids on six towns. Of 684 nonfatal casualties 66 were either direct ocular injury or some intracranial injury which affected vision. In 29 of these there was either complete or partial blindness or some permanent defect of vision. About 80 per cent of the eye injuries were due to flying débris. The high proportion of ocular to other injuries, in view of the small contribution the eyes make to the total mean projected areas of the body, can be explained by the greater vulnerability of the eye to small particles of débris; in circumstances when the latter will produce in the eye an injury which will need hospital treatment, it would produce a cut or abrasion of the surrounding skin which could be treated at a first aid station or at home. Serious eye injuries form a larger proportion of severe injuries of all types as the distance from the explosion increases.

Ophthalmologic Aspects of Head Injuries.—Ecker and Anthony describe the basis for a few ophthalmic syndromes associated with closed head injuries. They show that the fixed dilated pupil of Hutchinson is an infallible sign of raised intracranial pressure. It is usually due to a laterally placed intracranial lesion of the same side, which most often is in the temporal but may be in the frontal or parietal lobe. The pupillary change is caused by herniation of the medial part of the temporal lobe into the tentorial notch, the so-called tentorial pressure cone. This herniated portion of temporal lobe is said to pinch the ipsilateral oculomotor nerve but is more likely to act by displacing and rotating the midbrain in such a way as to exert traction on the nerve. Bilaterally dilated fixed pupils soon after a head injury indicate a bad but not hopeless prognosis. If they are associated with neurogenic hyperthermia, rapid pulse and quickly rising rectal temperature, with a cold skin and decerebrate rigidity, there is damage to the midbrain. The prompt intravenous administration of plasma and deliberate cooling of the skin may result in dramatic improvement. Argyll Robertson pupils may result from head injury. The lesion in these cases may be either in the central nervous system itself or in the peripheral efferent pathway to the pupil.

British Journal of Surgery, Bristol

32:225-336 (Oct.) 1944

Early History of Syphilis. J. J. Abraham.—p. 225.
Some Experience of Reparative Surgery in Middle East, with Short Review of 1,200 Cases Treated During Last Two Years. M. C. Oldfield.—p. 237.
Second Thoughts on Abdominal Surgery of 'Total' War: Review of Over 1,300 Cases. G. Gordon Taylor.—p. 247.
*Ischemic Nerve Lesions Occurring in Volkmann's Contracture. W. Holmes, W. B. Highet, and H. J. Seddon.—p. 259.
Surgery in Airborne Division. C. J. Longland and L. Kessel.—p. 275.
*Clinical Value of Growth Promoting Substance in Treatment of Indolent Wounds. A. B. Kerr, and H. Werner.—p. 281.
Fractures of Zygomatic Tripod. H. Ungley and S. C. Suggit.—p. 287.
Rupture of Pancreas. G. Keynes.—p. 300.
Gastroscopic Control of Treatment of Gastric Ulcer by Duodenal Feeding. H. Freeman.—p. 303.
Carotid Ligation for Intracranial Aneurysm: Report of Case Studied by Electroencephalography. L. Rogers.—p. 309.
Fascial Slinging of Scapula and Clavicle for Dropped Shoulder and Winged Scapula. G. C. Dorling.—p. 311.
Malignant Transformation in Previously Benign Tubular Adenoma of Kidney. W. Buckley.—p. 315.
Congenital Cyst of Common Bile Duct Containing Stones and Undergoing Cancerous Change. S. T. Irwin and J. E. Morison.—p. 319.

Ischemic Nerve Lesions in Volkmann's Contracture.—Holmes and his associates report 6 cases of established Volkmann's contracture which have been investigated at the Oxford Peripheral Nerve Injuries Center. These cases were subjected to full clinical and operative investigation, and specimens of muscle and nerve were removed for microscopic examination. The nerves showed an unusual type of pathologic change which is believed to be due to ischemia and the characteristics of which have a direct bearing on the prospect of recovery. In every case the upper limb was affected. In 5 of the 6 cases damage to the main artery of the limb was demonstrated at the level of the initial injury. In all cases there was extensive motor and sensory paralysis, but in only 2 of them was there evidence of direct traumatic injury to the main nerve-trunk. In 1 of the cases the median nerve was constricted between the two heads of the pronator teres, but in no other was there any evidence of compression of nerves by contracture of muscle or involvement in scar tissue. Microscopic examination demonstrated destruction of axons and myelin sheaths as in uncomplicated wallerian degeneration. In the more severely affected nerves there had been a great increase in the collagen of the endoneurium, sometimes leading to complete collagenous replacement of the nerve bundle. In 1 case the nerve was entirely necrotic. These changes are due to ischemia. Sensory and motor recovery has been of poor quality because of the irreversible nature of severe degeneration. There is no effective treatment for established ischemic nerve degeneration.

Growth Promoting Substance in Treatment of Indolent Wounds.—Kerr and Werner obtained from the Department of Experimental Pathology of the Hebrew University, Jerusalem, a tissue extract known to possess the property of stimulating growth in tissue cultures. This extract is a powdered preparation of sheep's heart which retains indefinitely its growth stimulating property toward tissue cultures and, if kept dry, is not readily contaminated. The authors used this extract in the treatment of indolent lesions in human subjects in whom

prolonged treatment by various orthodox methods had proved unavailing. The great majority responded favorably to the new treatment, and closure of the wounds was achieved in a relatively short time. Observations suggest that preliminary treatment with the growth promoting substance improves the take of transplants in skin grafting.

British Medical Journal, London

1:1-34 (Jan. 6) 1945

*Pulmonary Acariasis: Possible Cause of Asthma. E. Soysa and M. D. S. Jayawardena.—p. 1.
Urinary Elimination of Nicotinamide Methochloride in Subjects with Normal Gums and with Acute Chronic Gingivitis. R. A. Coulson, P. Ellinger and G. A. Smart.—p. 6.
*Erythrocyte Sedimentation Rate in Infective Hepatitis and in Malaria. P. Wood.—p. 9.
Treatment of Placenta Previa, with Special Reference to Use of Willett's Forceps: Report of 134 Cases. G. King and Daphne Chun.—p. 9.
Nylon for Buried Sutures. H. Haxton.—p. 12.
Resuscitation Methods for Rescue Boats. F. C. Eve.—p. 21.

Pulmonary Acariasis.—Soysa and Jayawardena report from a military hospital in Southeast Asia that during the past two years they have observed a heavy incidence of bronchial asthma. A number of these asthmatic patients showed eosinophilia ranging from 40 to 80 per cent but rarely gave a previous or family history of asthma. The authors review observations on 30 Ceylonese soldiers. Since their attention had been called to reports on the presence of mites in the sputum of patients with asthma, they decided to investigate the possible etiologic significance of occupation and environment in these asthmatic patients. The onset of the condition was slow and insidious, with an intermittent dry cough, particularly at night. Gradually the patients began to suffer from expiratory dyspnea with wheezing. These attacks, though mild and intermittent at first, became more frequent, causing loss of sleep with a feeling of lassitude, malaise and asthenia in the morning, leading to a gradual impairment of general health and physical fitness. Hematologic examination showed a constant eosinophilic leukocytosis with massive eosinophilia in many of the patients. Anthelmintic treatment of the few patients who required it, because of infection with Ancylostoma duodenale, Ascaris lumbricoides, Blastocystis hominis and so on, produced no reduction in the eosinophil count. The response to the oral administration of carbarsone and acetarsone was often dramatic. Tyroglyphus and Tarsonemus mites were demonstrated in the sputum of some of the patients. The authors believe that the patients had acquired their disability after the inhalation of mite-laden air. The majority had been exposed to dust emanating from rice and other cereals, pulses, flour, sugar, tea, coffee, cheese, dried fish, dehydrated vegetables, spices and other condiments, and various other dry rations and grocery products such as are issued in bulk through ration stores. A few patients had worked in depots where military equipment and miscellaneous articles such as linen and leather goods were stored. The frequent existence of tyroglyphid and tarsonemid mites in stores and stored products being recognized, all these patients must be regarded as having been exposed to the risk of inhalation of these mites, which were later recovered from their sputum.

Sedimentation Rate in Infective Hepatitis and in Malaria.—Wood agrees with Witts that a major difficulty in the preicteric stage of infective hepatitis is the differentiation from clinical malaria. Wood shows that the erythrocyte sedimentation rate is a simple test for this differentiation. He found that the behavior of the erythrocyte sedimentation rate in 35 unselected cases of infective hepatitis was normal during the first week or ten days. It rose steadily during the period of biliuria, to reach a maximum commonly between 15 and 30 mm. in one hour (Wintrobe). During the stage of recovery the erythrocyte sedimentation rate returned slowly to normal. The behavior of the erythrocyte sedimentation rate in malaria is in sharp contrast. Of 72 measurements made between the tenth and twentieth days in malaria, 60 ranged between 11 and 53 mm. in one hour. The raised sedimentation rate persists for several weeks. Summarizing his observations, Wood says that in the first ten days of infective hepatitis about 85 per cent of cases show an erythrocyte sedimentation rate below 10 mm. In the first ten days of malaria about 85 per cent of cases present an erythrocyte sedimentation rate above 10 mm. An erythrocyte sedimentation rate above 20 mm. in one hour during the first week of a person under observation practically excludes infective hepatitis. The erythrocyte sedimentation rate serves to distinguish clinical malaria from short-term fevers of uncertain etiology. In malaria the acceleration is maintained for at least two or three weeks in about 84 per cent of cases; in short-term fevers the erythrocyte sedimentation rate is commonly normal within one or two weeks of the onset.

Edinburgh Medical Journal

51:449-502 (Nov.-Dec.) 1944

Significance of Signs and Symptoms in Toxemia of Pregnancy. F. J. Browne.—p. 449.
Etiology of Diabetes Mellitus. R. F. Ogilvie.—p. 460.
An Edinburgh Tercentenary. H. P. Tait.—p. 475.
*Vitamin E and Adipose Tissue. Z. Menschik.—p. 486.

Vitamin E and Adipose Tissue.—Vitamin E deficiency is said to have widespread effects, and morphologic and functional changes have been described in many different organs. Menschik gives particular attention to the connection between vitamin E and the lipid metabolism. Experiments on vitamin E deficiency and on the influence of vitamin E administration have been carried on with mice since 1941 in the Department of Anatomy, Polish School of Medicine, University of Edinburgh. Different organs were examined and fixed for microscopic examination. Observations on adipose tissue are described because its behavior was one of the striking features differentiating animals fed on stock diet, vitamin E deficient diet and vitamin E rich diet. It was found that vitamin E deficiency in female mice, after a period of sixty-five weeks, caused the disappearance of adipose subcutaneous and subperitoneal tissue, although the vitamin E deficient diet used was rich in fat. If the same diet is supplemented with vitamin E in the daily dose of 2.5 mg. of alpha tocopherol the amount of adipose tissue is increased considerably in female mice. At present nothing can be said regarding the influence of vitamin E on human fat metabolism.

Journal Obst. & Gynaec. of Brit. Empire, Manchester

51:489-584 (Dec.) 1944

Carcinoma of Ovary. I. G. Williams.—p. 489.
Case Report of Effect of Hysterectomy on Ovarian Activity in Female Baboon. J. Gillman and Christine Gilbert.—p. 495.
Prophylactic Use of Pneumoperitoneum in Puerperium of Tuberculous Patients. Phillis Dingle.—p. 499.
*Report on 130 Consecutive Cases of Placenta Previa Without Maternal Death. J. Morgan.—p. 509.
Choledochus Cyst Complicating Pregnancy and Puerperium. J. T. Chesterman.—p. 512.
Analysis of 90 Cases of Transplantation of Ureters for Obstetric Vesicovaginal Fistula. M. Roberts.—p. 519.
Artificial Insemination (Report on 80 Cases). I. Halbrecht.—p. 526.
Recurrent Anencephaly: Case Report with Note on Etiology of Anencephaly and Allied Malformations. H. G. Dunn and J. G. Salter.—p. 529.
Separation of Symphysis Pubis During Delivery by Forceps. D. W. James.—p. 537.

Placenta Previa.—According to Morgan placenta previa occurs in from 1 to 2 per cent of all deliveries and has a mortality rate of from 2 to 8 per cent. The series of 130 cases of placenta previa reviewed in this paper occurred in a total of 8,000 deliveries. The placenta previa was central in 32 cases, marginal in 46 cases and lateral in 52. All but 2 of the women with central placenta previa were delivered by the cesarean operation. Of the 46 with marginal placenta previa 15 and of those with lateral placenta previa 2 were delivered by this operation. There was no maternal mortality. Of the 133 infants born (3 sets of twins) 114 were born alive and 19 were stillborn. Twenty-eight of the infants died. New methods of treatment were not used, and the favorable results as far as maternal mortality is concerned are probably due to increased use of cesarean section and blood transfusion.

Lancet, London

1:39-70 (Jan. 13) 1945

*Pleural and Pulmonary Suppuration Treated with Penicillin. J. E. H. Roberts, O. S. Tubbs and M. Bates.—p. 39.
Clinical Evaluation of Diphtheria Prophylaxis. J. Grant.—p. 46.
Inadequate Treatment of Syphilis. J. N. Twohig.—p. 48.
Primary Mumps Orchitis with Meningitis. R. P. K. Cae.—p. 49.
Intussusception Complicating Amebic Dysentery. E. Parry.—p. 50.
Asymmetery of Exophthalmos in Orbital Tumor and Graves's Disease. F. F. Rundle and C. W. Wilson.—p. 51.
Radiologic Diagnosis of Myocardial Infarction. D. R. Cameron and P. J. Kerley.—p. 52.
Sudden Death After Intravenous Neptal. J. B. Rennie.—p. 53.
Case of Rabies in Man. J. G. Fife.—p. 53.

Penicillin in Pleural and Pulmonary Suppuration.—Roberts and his co-workers report the results obtained with penicillin in chest injuries. Initially there was only sufficient for local application, and it was used in hemothorax, pyogenic empyema, tuberculous empyema with secondary pyogenic infection and extrapleural suppuration complicating thoracoplasty and extrapleural pneumothorax. Penicillin appears to lower the incidence of infection in cases of traumatic hemothorax. Twelve cases of acute pyogenic empyema have been treated locally. Sterilization is usually obtained readily, but aspiration and intrapleural injection of penicillin alone result in so much pleural thickening that operative treatment is required as soon as thick pus forms. Evacuation of all fibrin and subsequent closure of the wound may prove satisfactory in some cases, but the most uniformly good results will probably be obtained by drainage. Intrapleural penicillin will assume its most important role in cases diagnosed at an early stage when the fluid is still thin and localization has not occurred. This applies particularly to those of streptococcic origin with the pneumonic process remaining active, especially in children or the aged. Intrapleural penicillin is a valuable agent in eradicating secondary infection from tuberculous pleural effusions. Other local collections of pus in the chest—e. g. those complicating thoracoplasty—may be permanently sterilized by penicillin. The systemic administration of penicillin in cases of pulmonary suppuration requires much further investigation. The response of diffuse suppuration due to nonhemolytic microaerophilic streptococci appears to be good. The lesion in the lung improved in all 7 cases treated, but extension to the pleural cavity was not prevented in 2 nor was metastatic spread to the brain in 3 others. Improvement was obtained in only 1 of 6 cases of suppuration due to a mixed anaerobic flora. This was surprising in view of the rapid disappearance of such bacteria from 2 empyemas treated locally. A single case of localized pulmonary abscess due to Staphylococcus aureus and Streptococcus hemolyticus apparently responded well. Two patients with thoracic actinomycosis were treated. One of these showed dramatic improvement and the patient is now well. Follow-up is needed to see if the result is permanent. The other died of Pseudomonas pyocyanea pyemia originating from the infused vein.

Medical Journal of Australia, Sydney

22:653-676 (Dec. 23) 1944

Jackson Lecture—History of Appendicitis in Australia: Window on Abdominal Surgery. A. E. Lee.—p. 653.
*Calcium, Magnesium and Phosphorus in Milk of Australian Women. Dora Winikoff.—p. 660.

1:25-48 (Jan. 13) 1945

Social Medicine. R. Cilento.—p. 25.
Sociological Medicine: Its Meaning and Scope. E. P. Dark.—p. 31.
Thiamine for School Children. S. Mangold.—p. 34.

Mineral Content of Milk of Australian Women.—The work reported by Winikoff was carried out with the object of determining the calcium, magnesium and phosphorus content of maternal milk in Australia. The existence of a low mineral level could be regarded as a factor contributing to dental caries so prevalent in Australia. In preliminary work the differences in calcium, magnesium and phosphorus content of milk taken (*a*) from different breasts, (*b*) at different times during one day and (*c*) at the same time on different days were studied. Milk taken at the same time from both breasts of 4 patients has shown negligible differences in mineral content. The fluctuations during one day were considerable. The differences, however, were much greater for different women than in any individual woman. The day to day variations were pronounced during the first five days after parturition. After this fluctuations were small. No differences could be shown between primiparas and multiparas. The amount of milk excreted had no effect on the mineral level. During the colostral period the milk of 212 normal women was examined for calcium and magnesium content and that of 25 women for phosphorus content. The mean calcium values was 28.2 mg. per hundred cubic centimeters. This is lower than the value given by workers in other countries. The mean value for magnesium was 3.22 mg. and for phosphorus 15.9 mg. per hundred cubic centimeters. The magnesium level was about the same as that reported by workers in other countries. The mean values for the three minerals in the milk from 18 women with such conditions as albuminuria, postpartum hemorrhage, eclampsia and prematurity were close to normal; that is, these conditions did not seem to influence the mineral content of the milk. In the later stages of lactation 155 milk samples from 65 normal mothers were examined. The mean values were compared with the results obtained at Canberra for Australian women and with results for European, American and Japanese women. The mean value for calcium rose from the colostral period through the first, second and third months, and then it gradually declined till the eleventh month. The Australian figures appear low. The mean magnesium value varied little during the period of lactation. The mean value for phosphorus fell steadily from the colostral period up to the seventh month, remained at the same level for three consecutive months and then declined up to the eleventh month. The Australian results for phosphorus are low compared with those in other countries.

New Zealand Medical Journal, Wellington

43:265-310 (Dec.) 1944

Cyanate Treatment in Hypertension: Survey of 40 Cases. E. J. Fischmann.—p. 267.
Sudden Total Blindness Following Ischemic Retinitis. C. T. Newton.—p. 272.
Management of Closed Head Injuries. M. A. Falconer.—p. 274.
*Outbreak of Cadmium Poisoning. G. G. Jenner and J. A. K. Cunningham.—p. 282.
Some Experiences in War Surgery in Middle East. E. Button.—p. 284.
*Epidemic Pleurodynia: Report of Outbreak at Royal New Zealand Air Force Station in Marlborough. R. N. Akel.—p. 289.
Incompatible Transfusion with Recovery: Case Record. D. T. Stewart.—p. 292.

Cadmium Poisoning.—Jenner and Cunningham report an outbreak of cadmium poisoning which affected 62 airmen who had eaten of fruit juice prepared by dissolving dehydrated lemon powder and canned grapefruit juice in water and ice. The mixture had been made in a metal urn with a galvanized interior. Symptoms developed from fifteen minutes to one hour after taking the drink. Severe vomiting was associated with acute colicky abdominal pain and diarrhea. Later many complained of headache and dry throat. The majority had completely recovered in one or two days. Investigation revealed that the concentration of cadmium in the fruit drink was about 20 mg. per hundred cubic centimeters. The amount of metal ingested by each patient was estimated at 56 mg. The most probable source of the cadmium was the galvanized lining of the vessel. The use of galvanized containers for mixing and dispensing drinks which are acid is to be discouraged. Glass, crockery or pure aluminum is a suitable material for such vessels. The possibility of cadmium contamination should be considered in obscure cases of food poisoning in which the ingested material is of a low p_H and has stood in a galvanized container.

Epidemic Pleurodynia.—Akel reports an epidemic of pleurodynia in a Royal New Zealand Air Force station. Thirty-two cases were admitted to the station hospital; milder cases were treated at the sick quarters of the various camps. The typical clinical picture seen in this outbreak consisted of pain—upper abdominal or lower thoracic—dull grip or sharp spasm, aggravated by deep breathing or movements and of moderately sudden onset, usually preceded by slight malaise or

chill. Pyrexia of 101 F. lasted not more than three days. Convalescence was uneventful provided sufficient bed rest was given. Treatment consists in the liberal use of salicylates and opiates. The splinting of the affected areas by strapping usually furnished considerable relief from the pain. Absolute rest in bed was enforced in the early stages, as this decreased the possibility of recrudescence. When not occurring in epidemics, pleurodynia is difficult to diagnose and numerous cases have been labeled influenza, pleurisy, pneumonia, acute abdominal emergency and myalgia.

Practitioner, London

154:1-64 (Jan.) 1945

General Practitioner and Midwifery Service. E. Holland.—p. 1.
Difficult Labor. H. R. MacLennan.—p. 6.
Modern Views on Toxemia of Pregnancy. J. E. Stacey.—p. 11.
Diagnosis and Treatment of Hemorrhage in Late Pregnancy. A. C. Bell.—p. 20.
Care of Premature Baby, with Special Reference to Baby Born in Its Own Home. V. Mary Crosse.—p. 26.
Clinical Aspects of Psychiatric Problems in Army. J. D. W. Pearce. —p. 33.
Observations for Practitioner in Relation to Diagnostic Radiology. D. M. Scrimgeour.—p. 39.
Cardiovascular Disturbances Due to Vitamin B_1 Deficiency. A. Schott. —p. 46.

Prensa Médica Argentina, Buenos Aires

31:2423-2476 (Nov. 29) 1944

Myxedematous Pericardial Effusion: Chronic Cardiac Tamponade. R. A. Bullrich, R. Repetto and J. A. Ferrari.—p. 2423.
Fracture of Femoral Diaphysis: New Contribution to Problem. G. R. Fisk.—p. 2433.
Hydatid Cyst of Lung: Cystotomy with Marsupialization. Locoregional Anesthesia Combined with Controlled Intrabronchial Pressure. H. Aguilar.—p. 2437.
Cancer of Colon. O. E. Napp.—p. 2441.
Otitis in Infants. A. Hernández and J. L. Villegas.—p. 2448.
Appendicitis: Costoiliac Approach for Posterior Appendicitis. D. E. Zavaleta.—p. 2451.
Carcinomatosis of Bone Marrow: Acute Purpuric Form. L. Braier and R. A. Pereira Torres.—p. 2458.
*Reaction for Recognition of Ascorbic Acid (Vitamin C): Application to Various Fruits and Vegetables. L. Rossi and Maria N. Aguirre de Celsi.—p. 2463.

Reaction for Recognition of Vitamin C.—Rossi and Aguirre de Celsi utilized the great reducing power of ascorbic acid for ferric cations and thus indirectly proved the presence of vitamin C. As reagents they used (1) a saturated solution of dimethylglyoxime in ethyl alcohol, (2) a 28 per cent solution of ammonia and (3) a 1 per cent solution of ferric chloride. To 1 drop of the ferric solution they add 2 drops of the substance to be tested and then a drop of dimethylglyoxime and several drops of ammonia until the reaction is alkaline. If ascorbic acid is present a reddish coloration results. In assays on the sensitivity of this reaction it was found that the limit of identification was 0.000002 Gm. of ascorbic acid. The authors used the reaction with success on various fruits and vegetables.

Deutsche Zeitschrift für Chirurgie, Berlin

258:133-318 (Sept. 3) 1943. **Partial Index**

Bactericidal Power of Blood in Patients with Tuberculosis. E. Wegemer and K. H. Büsing.—p. 198.
Observations on Pains from Gunshot Injuries to Nerves (Causalgia). B. Pfab and K. Raffler.—p. 208.
Myositis Ossificans Circumscripta Neurotica after Vertebral Fractures in Paraplegic Patients. H. Hanke.—p. 217.
Effect of Acute Brain Pressure on Circulation and on Blood Sugar. Clinical-Experimental Study. W. Osterchrist.—p. 222.
Problem of Bomskov's Hormone of Thymus. H. Güthert, E. Schairer and J. Rechenberger.—p. 236.
Dysostosis Multiplex (Hurler's Disease) and Aspects of Closely Related Diseases. F. Nöller.—p. 259.
Time for Surgical Intervention. E. von Novák.—p. 281.
*Conservative Management in Frostbite of Second and Third Degree. U. Luetkens.—p. 293.

Conservative Management in Severe Frostbite.—In peacetime Luetkens had obtained good results from treatment of mild frostbite involving the hands and feet with daily baths for from twenty to forty minutes in copper sulfate (1 teaspoon in a large basin of water at body temperature). The same good results were obtained from treatment of mild frostbite involving the face with daily applications for thirty minutes of gauze or cotton soaked with copper sulfate solution. The results suggested that copper sulfate has a specific effect on the damaged tissues; arterial blood perfusion is restored to normal, venous stasis causing edema is removed and normal tissue metabolism is stimulated. The same treatment was practiced in 24 cases of second and third degree frostbite in soldiers who presented extensive necrosis of the hands and feet and whose temperature was septic. The secondary gangrenous inflammation improved and the temperature was restored to normal. The line of demarcation appeared spontaneously. Pain was alleviated after the second or third bath and disappeared completely after the fifth or sixth bath. Erosion hemorrhage, which occurred frequently prior to the copper sulfate treatment, was not observed after this treatment was instituted. The power of regeneration was stimulated in those tissues which had retained their capacity of reproduction, and the aseptic drying of the necrotic tissues was supported at the same time. The frozen portions of the extremities were covered with linen to which ointment had been applied and loose bandages were used to avoid painful daily removal of the dressing prior to the bath. The refractory edematous swelling improved during the first week of the treatment in 20 additional cases of severe frostbite in which treatment with copper sulfate was instituted after amputation or exarticulation. Pains during walking exercises after amputation of the leg were diminished, cleansing and epithelization of the still open areas was accelerated and the temperature in the stumps was improved.

258:319-510 (Nov. 10) 1943. **Partial Index**

*Treatment by Circular Incision and by Scarification for Functional and Anatomic Disorders of Blood Perfusion. F. Sauerbruch and A. Jung. —p. 319.
Treatment of Defect-Pseudarthrosis of Leg by Means of Klapp's Distraction Apparatus. O. Wiedhopf.—p. 342.
Dental Arch of Superior Maxilla as a Basis of Apparatus in Surgical Intervention on the Head in Cases of Fractures and of Correction of Nose, of Plastic Surgery of Face and of Mobilization of Ankylosis of Maxilla. W. Kunzendorf.—p. 348.
Treatment of Ankylosis of Maxilla by Osteotomy of Ascending Branch of Jaw. A. Studemeister.—p. 358.
Rotation Symptoms in Injuries of Meniscus. C. van Gelderen.—p. 380.
Primary Suppuration of Bone Marrow in the Patella. H. Saupe.—p. 386.
*New Type of Treatment of Infected "Bone Cavities" After Gunshot Injuries ("Sea Sand Plugging"). W. Hetzar.—p. 413.
*Treatment of Prostatic Hypertrophy and of Cancer of Prostate. H. Kohlmayer.—p. 468.

Surgical Intervention for Disorders of Blood Perfusion.—For several years incisions around the wound and scarifications have been practiced with good results at Sauerbruch's clinic for improving blood perfusion and nutrition of tissues. The method of the incisions around the refractory wound consists in making one or several parallel circular incisions at a distance of several millimeters around the wound or around the ulcer. The incisions are made through the epidermis and through the cutis and may reach the subcutis, but larger vessels and nerves should be spared. Circles or ellipses are the common forms of these divisions of tissues. The procedure is simple and the intervention may be performed under local ethyl chloride or ether spraying anesthesia. Epinephrine should not be added in cases in which procaine hydrochloride infiltration anesthesia may be employed. After the intervention the area operated on may be covered with a loose dressing and the extremity involved may be elevated for a short time. The scarifications may be produced in areas immediately adjacent to the focus of the disorder or at some distance from it. Numerous incisions from 2 to 3 cm. in length should be made above or below the focus and parallel to the axis of the extremities. In circumscribed disorders of nutrition in the foot the incisions should cover larger areas of the leg up to the knee joint and in advanced cases even farther up to the crest of the ilium. Downward the incisions may be extended to the dorsum of the foot and to the toes. This operation may likewise be performed under ethyl chloride spraying or on sensitive patients

under light general anesthesia. Healing of these artificial wounds takes place within eight to ten days. Flat, fine scars are the result. Definite healing of the scarification wounds without any complications occurs even in cases of severe disorders of circulation in which necrosis of the toes or of the anterior part of the foot may have developed. Incisions on the edge of the tibia may delay the process of healing and should consequently be omitted. Active vasodilatation in all the layers of the tissues is the result of the incisions around the wound as well as of the scarifications. The increase in the entire blood supply and in the blood perfusion of the extremities was demonstrated with the oscillograph. The new methods proved effective (1) in cases of obstruction of the arterial blood supply associated with edema and venous stasis, (2) in cases of disorders of nutrition resulting from senile arteritis or from arteritis in patients with diabetes mellitus (preparatory insulin treatment is required in the latter cases), (3) in cases of Winiwarter-Bürger's disease (multiple scarifications are suggested in the early stage of this disease) and (4) in frostbite. Scarifications have a definite effect in all stages; vascular spasms may be checked in the initial stage and better blood perfusion may be elicited. Threatened tissue areas recovered and necrosis did not occur. It seems advisable to extend the area in which the incisions are made, e. g. from the foot to the thigh. Repeated incisions may be required to insure definite healing.

Sea Sand Plugging of Infected Bone Cavities.—Hetzar reports experience gained from treatment with sea sand of large "cavernous" bone defects, particularly after gunshot injuries in which the projectile is retained in the bone cavity. Chronic osteomyelitis associated with permanent fistulization may not be prevented by the surgical removal of the foreign body from parts of the skeleton, particularly from the bones of the extremities. The main problem is the callous closing of the inflammatory bone cavity. Conservative treatment with sea sand may be practiced only when the acute florid osteomyelitic process has subsided to a chronic stage. At this stage the external opening of the bone defect must be slightly enlarged, the necrotic osseous decomposition products scooped out with a spoon and sequestrums removed. The cavity is filled with sterilized sea sand; the filling of the cavity should be extended to the surface of the outer skin. The plug should be covered with imbricated strappings of adhesive plaster. Fixation of the leg involved may be performed with Volkmann's splint, and an abduction splint may be applied to the arm. The secretion of the wound is absorbed by the sand and there is no suppuration. After an eight day rest the dressing may be removed and the wound cleansed with a swab. Irrigation of the wound is undesirable, and the filling with the sterilized sand should be repeated at eight day intervals. A period of from eight to twelve weeks is required for the formation of "firm masses," depending on the extent of the cavity. After-treatment may consist in ordinary dressing and in continued immobilization of the limb. X-ray examination of 3 wounded soldiers with shell fragments retained in the head of the right humerus, in the tarsal bone and in the condyle of the tibia respectively demonstrated that regeneration of the bone substance resulted from the treatment described. Function of the extremities was restored to normal. Silicon dioxide, the principal ingredient of the sand, is extremely hygroscopic. Its readiness to absorb moisture makes it suitable for draining the infectious process. The bone marrow requires the withdrawal of fluids for the new growth of bone. In addition to the desiccating effect of the sand its small grains may stimulate the new growth, which seems to originate in the endosteum without any participation of the periosteum. The treatment is economical because sand is inexpensive and helps to save dressing material. Not the slightest untoward reaction has been observed.

Surgical Treatment of Prostatic Disorders.—Kohlmayer reports experience gained from 238 cases in which prostatectomy was performed and from 194 cases in which transurethral prostatic electroresection was practiced at Denk's surgical clinic in Vienna from 1934 to 1942. One hundred and twenty-five of the 194 patients were operated on with a modern McCarthy cutting loop, the large and broad loop of which insured the excision of considerable portions of tissue and the retrograde lens system insured adequate vision of the resected area. Spinal anesthesia with tropacocaine is the method of choice in prostatectomy, whereas evipal sodium is the preferred anesthetic in electroresection. Prostatectomy is the method of choice in benign cases of so-called prostatic hypertrophy which present a large, soft prostate. The essential features of Kohlmayer's technic of prostatectomy are use of the Harris suture made with the Boomerang needle-holder, insertion of a thin drain for two or three days followed by closure of the vesicle, omission of tamponade (the mortality rate in cases with tamponade amounted to 11.6 per cent as compared to 2.7 per cent in those without) and local prophylactic treatment of the suprapubic operative wound with sulfathiazole powder. Electroresection is suggested in cases of prostatic hypertrophy with a small hard prostate, in which the good results following resection equaled those following prostatectomy. Electroresection is likewise recommended for so-called sphincter scleroses and specifically for subvesical microhypertrophies. Electroresection should not be undertaken in cases of soft large prostate except for those in which prostatectomy cannot be practiced for extrarenal reasons such as abnormal obesity, disorders of the heart and circulation, severe emphysema and chronic bronchitis. A multiple stage resection may be preferred in the latter cases in order to reduce the risk. Electroresection is the method of choice for cancer of the prostate. Reports of 8 cases of cancer of the prostate reveal that there was no residual urine after the resection or that the residual urine was reduced considerably. Recovery was demonstrated on continued control of these patients, provided there were no metastases and no nerve pains. Electroresection may for years insure the feeling of good health in inoperable patients in spite of the palliative character of this method.

Medizinische Klinik, Berlin

39:511-540 (July 23) 1943. **Partial Index**

Skin Diseases. G. Kroemer.—p. 511.
Modern Points of View in War Surgery. H. Kosic and W. Sargo. —p. 513.
Diagnostic and Therapeutic Importance of Reflex and of Algetic Symptoms. F. Dittmar.—p. 517.
Chemotherapy in Croupous Pneumonia. E. F. Rissmann.—p. 519.
*Problems of Acute Porphyria. J. T. Brugsch.—p. 523.
Fever Therapy in Torpid Skin Defect. W. Müller—Alberti.—p. 526.
Resistance to Chemotherapy of Various Strains of Gonococci. H. von Schelling.—p. 528.

Acute Porphyria.—Brugsch discusses the symptomatology of acute porphyria, which begins with abdominal symptoms of colic, constipation and vomiting. Disturbances of the nervous system such as amaurosis, facial nerve paresis and paresis of muscles of the shoulder and of the arm may be present. The disturbances in the muscles are to be considered as those of myoglobulin metabolism. Psychic disturbances may occur and the patients may become delirious. Differential diagnosis may be difficult, since porphyria may occasionally be associated with considerable leukocytosis. Urinalysis is suggested in doubtful cases of abdominal colic, nervous disturbances, polyneuritis and toxic psychosis. A simple test should be performed prior to surgical intervention by boiling the urine with 25 per cent hydrochloric acid. Porphyria is suggested by an intense dark red-brown discoloration of the urine. Demonstration of uroporphyrin in the urine is a definite proof of porphyria. Demonstration of uroporphyrin may be difficult because of simultaneous presence in the urine of a red pigment which may be responsible for its discoloration. The pigment may be excreted as chromogen. It is insoluble in ether, in contrast to the soluble urobilinogen which may likewise be present. The term porphyronin is suggested for this peculiar red pigment which is characteristic of porphyria, and another new term, porphyrogen, is suggested for the chromogen. Reports of 3 cases of porphyria in women aged 38, 46 and 44 are presented. None of the patients died. A family tendency to porphyria, a hereditary disturbance of the porphyrin metabolism, could be demonstrated in these cases. Colics alternated with free periods. Medical treatment with sedatives as well as surgical intervention are contraindicated, since the deteriorated porphyrin metabolism may become worse. Anesthesia, hemorrhage and destruction of tissue may place an additional load on the already disturbed metabolism, and collapse and death may follow.

Book Notices

The Doctor's Job. By Carl Binger, M.D. Cloth. Price $3. Pp. 243. New York: W. W. Norton & Company, Inc., 1945.

Many a writer has tried to explain the doctor-patient relationship to the public. Nowadays people are much more interested than they used to be. When medicine was mostly mysticism, people had to have confidence in their physicians and follow blindly the instructions given; today medicine is much more scientific. People are learning much more about its technics and even about its theories. Once mind and body were considered as two wholly separate factors in health. Today the intimate relationship between mind and body has become a special department of medicine called psychosomatic medicine.

In a smooth, rather conversational tone, Dr. Binger discusses the evolution of modern medical science, the growth of specialization, the doctor-patient relationship, the influence of psychoanalysis and psychosomatic medicine on modern practice, and our present knowledge of a number of common conditions. He turns then to the organization of medicine for service, with special attention to convalescent care, preventive medicine and socialized medicine. Although the book will say little that is new to the doctor, it will say much that is important to the public. Dr. Binger does not see medicine as a completed science but as one in an early stage of evolution. He sees the great problem of the future as the maintenance of humanity against the advance of the machines and a better distribution of all that is good in life. The book is written with a fine background of medical history, with culture and with sympathy. Dr. Binger loves his profession and respects it. That is the tone of his book. It is so much better than most of the diatribes, exposés or encomiums written at both extremes of the subjects it discusses that it merits a great audience. Physicians need not hesitate to recommend it to their patients.

The Midwest Pioneer: His Ills, Cures, & Doctors. By Madge E. Pickard and R. Carlyle Buley. Boards. Price, $5. Pp. 339, with illustrations. Crawfordsville, Indiana: R. E. Banta, 1945.

This volume comes as a great surprise at a time when restrictions on the use of paper have made books with adequate margins, widely spaced type and fine printing an unusual item in the field of typography. The authors have had the assistance of several physicians, who have aided in the collection of the material. Their book gives a good picture of the state of medical practice in the Midwest during pioneer times. There are records of the early development of the medical schools in the Midwest and of the medical periodicals. The charlatans are given adequate consideration. Altogether, this is a volume that will appeal to any physician interested in medical history in the United States. The book is illustrated with interesting black and white sketches and reproductions.

Patients Have Families. By Henry B. Richardson, M.D., F.A.C.P., Associate Professor of Clinical Medicine, Cornell University Medical College, New York. Cloth. Price, $3. Pp. 408. New York: Commonwealth Fund: London: Oxford University Press, 1945.

In his introduction the author points out that the relationship of the patient to the family is like that of the organ to the diseased body. The recognition of the patient as part of the family unit is particularly the concern of the medical social worker and the neuropsychiatric social worker. After discussing the family as a unit of illness and treatment, the author considers the special problems that have arisen in wartime and the possibilities for future research. The book is based on studies conducted cooperatively by the faculties of public health, medicine and psychiatry of Cornell University Medical College and the New York Hospital. In the current trend toward a social point of view in medical practice, this work establishes fundamental technics.

Food Values of Portions Commonly Used. Compiled by Anna dePlanter Bowes, M.A., and Charles F. Church, M.D., M.S. Fifth edition. Paper. Price, $1.50. Pp. 46. Philadelphia, 1944.

The continuous reproduction and modification of this work since 1937 indicates that it is a most useful compilation. As a table-side companion for those desiring to reduce, no other work can be more recommended.

A New German-English Psycho-Analytical Vocabulary. By Alix Strachey. Research Supplements to the International Journal of Psycho-Analysis. Edited by Edward Glover. No. 1. Fabrikold. Price, $2.50. Pp. 84. Baltimore: William Wood & Company, 1943.

Glossary of Technical Terms for Beginning Students in Abnormal Psychology, Mental Hygiene and Medical Social Service. Compiled by Calvin P. Stone, Professor of Psychology, Stanford University. Paper. Price, 25 cents. Pp. 15. Stanford University, Calif.: Stanford University Press; London: Oxford University Press, 1944.

Almost from the first the psychoanalysts developed a jargon of their own which makes their terms difficult for the average physician. This "New German-English Psycho-Analytical Vocabulary" will not help very much in making an undertsanding easier. It seems rather to be even more confusing, since it depends largely on the German language and translates most of the German terms into English by giving the same term over as if it were English. The terms that are not thus translatable are easily found in any German-English dictionary.

The student of neurology and psychiatry will find the fifteen page "Glossary of Technical Terms" with a selection of terms for definition far more useful. It constitutes in brief a condensed course in neuropsychiatry.

The Avitaminoses: The Chemical, Clinical and Pathological Aspects of the Vitamin Deficiency Diseases. By Walter H. Eddy, Ph.D., and Gilbert Dalldorf, M.D., Pathologist of the Grasslands, and Northern Westchester Hospitals, Westchester County, New York. Third edition. Cloth. Price, $4.50. Pp. 438, with illustrations. Baltimore: Williams & Wilkins Company, 1944.

This edition gives evidence of having been extensively revised to include recent important contributions in the literature. The book covers more material than its title indicates. Information concerning recently established facts on the nature and function of vitamins is given in the forepart of the book. Inclusion of the historical development in each case traces the progress made in knowledge concerning vitamins to the present. The authors offer a rational discussion of the relationship of nutrition to health and disease, pointing out the frequent misconception and overemphasis so often placed on the role of vitamins in nutrition.

The main body of the book covers the experimental and clinical findings associated with deficiency of the vitamins which have been shown to be essential for man and other less well known B factors and vitamin E. The material is covered well from the point of animal studies and observations on human beings, with clear distinction made between the two. Much practical information on the relation of vitamin lack to clinical disease conditions is found in the book. Histologic sections showing tissue changes associated with vitamin deficiencies are reproduced. Special diagnostic aids for detection of deficiencies and methods of treatment are included, although this is incidental to the main purpose of the book. Criticisms are limited to the inadequate discussion of riboflavin deficiency, in which no mention is made of the contention of some ophthalmologists that certain vascular changes in the cornea are not attributable to riboflavin deficiency. The sections at the end of the book appear to be cut short and poorly organized. They might better have been omitted.

Altogether this book can be considered a valuable summary of the present knowledge of vitamin function and effect of vitamin lack. The facts are accurately recorded and supported by an extensive bibliography. The close correlation of experimental work, pathology and clinical observations is noteworthy.

John Dalton: Some Unpublished Letters of Personal and Scientific Interest with Additional Information About His Colour-Vision & Atomic Theories. By E. M. Brockbank, M.B.E., M.D., F.R.C.P. Publications of the University of Manchester No. CCLXXXVII. Cloth. Price, $2; 7s. 6d. Pp. 62, with 10 illustrations. Manchester, England: Manchester University Press, 1944.

At the meeting of the British Medical Association in Manchester in 1929 Dr. Brockbank read an essay with the title "John Dalton—Experimental Physiologist and Would-Be Physician." Dr. Brockbank became interested because he had access to letters, documents and materials that had been used by Dalton. The material has now been developed into a monograph that is a fine contribution to medical history. Here is the genesis of the anatomic theory and the beginning of scientific chemistry.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

IMMUNIZATION OF DOGS AGAINST RABIES

To the Editor:—I should like to know the current status of the immunization of dogs against rabies. Last year, in an adjacent county, compulsory single injection vaccination at state expense was instituted because of an increase in the number of rabid dogs. At the same time Washington, D. C., had a number of cases confirmed by laboratory examinations and at least two human deaths despite adequate Pasteur treatment. At the present time, following the discovery of several rabid dogs in the Washington area, the District health authorities are advocating a program of compulsory immunization of all licensed dogs in the District. They have made the statement that a new method developed "by an Alabaman" has made the one dose method an effective prophylactic. On the other hand Kern (*M. Clin. North America*, November 1944) states that "the immunizing value of such treatments is directly proportional to the number of doses used. . . . As W. J. Lentz (*J. Am. Vet. M. A.* 76:34, 1930) has shown experimentally, the single dose method is probably worthless. . . . Immunization of dogs is of value only if it is carried out by a course of at least five doses of good rabies vaccine, and if it is repeated once or twice at intervals of a year." It is further stated, by both Kern and others, that the one shot method can be dangerous by engendering a false sense of security in both dog owners and health officials. My own reaction lies more toward this view. It is my belief that the cost of such a program would be more effective if directed toward a more rigid licensing and quarantining of dogs and to a more active program of removing stray (licensed or not) dogs found running at large. Specifically I should like to inquire whether any reliable one or two dose method for the immunization of dogs exists, and I should also like some comment on the most logical and feasible methods to be employed in the control of such an outbreak.

William C. Claudy, M.D., Washington 6, D. C.

ANSWER.—The question whether a reliable one or two dose method of immunizing dogs is available can now be answered affirmatively. The experiments by Johnson and Leach (Studies on the Single Injection Method of Canine Rabies Vaccination, *Am. J. Pub. Health* **32**:176 [Feb.] 1942) have established that the single subcutaneous injection of a chloroform-treated or carbolized antirabic vaccine produces a high degree of immunity in the dog. In Alabama the vaccination of dogs appears to be giving satisfactory results. An effective program to control canine rabies must include quarantine to prevent the spread of the virus by stray dogs and dog traffic. There seems to be no question that canine rabies can be controlled by means of quarantine and vaccination. It should be borne in mind that the virus may be spread to the dog by other animals than the dog, e. g. the rat, the squirrel, the domestic cat, the woodchuck, the fox and the skunk; hence the entire dog population of a community must be kept immunized in order to secure complete safety from canine rabies.

DAKIN'S SOLUTION—SULFONAMIDES AND THE HEALING OF FRACTURES

To the Editor:—Has the use of Dakin's solution become taboo, or is it still useful? The statement has been made that the sulfonamides are definitely acid in reaction, that their use definitely delays union in compound fractures and that they are frequently the cause of nonunion. What is the general opinion?

Harry G. Nicks, M.D., St. Louis.

ANSWER.—The use of the sodium hypochlorite solution (Dakin) has been almost completely abandoned in this country. The English surgeons use it occasionally, particularly in the envelop treatment of burns of the extremities. The Carrel-Dakin treatment has been given up because it is cumbersome and because of more effective newer methods.

Sulfonamide compounds possess little acidity and when applied locally to wounds do not affect the p_H of the secretions of the wound. The slightly acid effect of sulfonamides can be combated by the simultaneous administration of sodium bicarbonate. A sufficient intake of water and an adequate output of urine will prevent the deleterious effect of these drugs on the kidney.

The Committee on Medical Research of the Office of Scientific Research and Development, in a report which included 471 cases of compound fractures, concluded that the sulfonamides minimized the spread of general infections and cut down the incidence of septicemia and death. They did not find evidence, however, that the sulfonamides lessened the incidence of local infection.

The consensus is that the sulfonamides, applied either locally or systemically, have a definite place in the treatment of compound fractures. Local application is generally practiced in first aid, in follow-up treatment at the time of débridement and subsequently at the infrequent dressings required by the open fracture. The unfavorable results reported in the early use of the sulfonamides were due to indiscriminate use of the drugs by local application. It is felt now that the maximal local dosage for a large wound should not exceed 8 Gm. of a sulfonamide. Major Lyons, who is considered an authority on the subject, believes that systemically administered sulfonamides are as effective as sulfonamides applied locally. Sensitivity of the hemolytic streptococcus is such that the systemically administered concentration is as effective as the higher local concentration.

Sulfonamides, whether applied locally, systemically or by both methods, have no deleterious effect on the healing of compound fractures provided they are used in proper amounts.

References:

Meleney, Frank L.: Study of Prevention of Infection in Wounds, Fractures and Burns, *Bull. U. S. Army M. Dept.* **72**:41 (Jan.) 1944.
Franklin, Fred W.; Ogilvie, W. H.; Lyons, Champ; Owens, Neal; Shaar, Camille M., and Thompson, A. H.: War Wounds and Burns, *Clinics* **2**:1194 (Feb.) 1944.

GENTIAN VIOLET IN TREATMENT OF OXYURIASIS

To the Editor:—1. What information is available as to the toxicity of gentian violet when given in enteric coated tablets in the dose level of 3 grains (0.2 Gm.) per day for adults and the correct dose level for normal children? Faust and Wright and Brady recommend 1 grain (0.06 Gm.) enteric coated tablets one hour before meals, three times a day, until 50 grains (3.25 Gm.) is taken in the case of strongyloides and 30 grains (2 Gm.) in the case of oxyuris infection. An investigation made by one of my students indicated that the enteric coating of gentian violet tablets as sold by various companies on the market varied considerably in disintegration time. Further, when an accurately tested four and one-half hour enteric coated tablet is given to normal persons minor intolerances, with special reference to vomiting, are reduced to almost nil. 2. Reports in the literature on the gentian violet treatment of pinworms indicate that ascarids should be eliminated before treating with gentian violet. This precaution was first encountered in the treatment of hookworm with carbon tetrachlorids and tetrachlorethylene; these volatile organic solvents stimulate the ascarids and cause migration. However, in in vitro tests, using Ascaris suis, carbon tetrachloride and tetrachlorethylene stimulate ascarids into great activity, causing them to try to crawl out of the beaker, whereas when they are immersed in various strength solutions of gentian violet they are depressed and become inactive and rigid. These observations would indicate that the precaution of eliminating ascarids prior to administration of gentian violet is unnecessary.

J. D. McIntyre, Professor of Physiology, Philadelphia.

ANSWER.—1. When given at the rate of 3 grains (0.2 Gm.) a day for adults and the correct dose level for normal children, gentian violet may produce gastric irritation in some persons. More recent papers on the use of this drug in oxyuriasis present no new evidence concerning toxicity, the percentage of reactions being about the same as those reported by Wright and Brady. Such reactions are usually limited to nausea, vomiting and diarrhea, with occasional symptoms of headache, constipation and lassitude. As far as is known, reports of serious reactions have not appeared in the literature.

2. Wright and Brady suggested the presence of Ascaris lumbricoides as a contraindication for gentian violet therapy not on the basis of any evidence but as a matter of precaution pending more information concerning the possibility of the drug stimulating the worms to inordinate activity, such as occasionally occurs following the administration of chlorinated hydrocarbons. As far as is known, cases of this sort have not been reported, although it seems probable that the drug has been given in cases with concomitant Ascaris infections. The information in the query would seem to indicate that the drug has an opposite effect from that of stimulation. If such is the case there would be little danger in the administration of the drug to patients with Ascaris infection.

PAINS IN ARMS DURING LATE PREGNANCY

To the Editor:—A correspondent in Queries and Minor Notes in The Journal, Feb. 17, 1945, inquires about the cause of pains in the arms, hands and fingers in women during the last months of pregnancy, occurring especially at night. It seems to me that this symptom might be explained on the basis of compression of the brachial plexus (the scalenus anticus syndrome). Women in the late months of pregnancy habitually sleep on one side or the other, and this position is conducive to such symptoms in certain people. Reichert (The Journal, Jan. 24, 1942, p. 294) has described methods of arranging pillows in order to relax the scalenus muscles. Many patients can be relieved in this way.

H. E. Lawrence, Lieutenant, M. C., A. U. S.

JOURNALS ABSTRACTED IN THE CURRENT MEDICAL LITERATURE DEPARTMENT, JANUARY—APRIL 1945

Titles have been listed or abstracts made of important articles in the following journals in the Current Literature Department of THE JOURNAL during the past four months. Any of the journals, except those starred, will be lent by THE JOURNAL to subscribers in continental United States and Canada and to members of the American Medical Association for a period not exceeding three days. Three journals may be borrowed at a time. No journals are available prior to 1933. Requests for periodicals should be addressed to the Library of the American Medical Association and should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Thus most of these journals are accessible to the general practitioner.

Acta medica scandinavica. Stockholm.
Acta paediatrica. Stockholm.
American Heart Journal. St. Louis.
American Journal of Clinical Pathology. Baltimore.
American Journal of Digestive Diseases. Fort Wayne, Ind.
*American Journal of Diseases of Children. A. M. A., Chicago.
American Journal of Hygiene. Baltimore.
American Journal of the Medical Sciences. Philadelphia.
American Journal of Obstetrics and Gynecology. St. Louis.
American Journal of Ophthalmology. Cincinnati.
American Journal of Physiology. Baltimore.
American Journal of Psychiatry. New York.
American Journal of Public Health. New York.
American Journal of Roentgenol. and Radium Therapy. Springfield, Ill.
American Journal of Surgery. New York.
American Journal of Syphilis, Gonor. and Venereal Diseases. St. Louis.
American Journal of Tropical Medicine. Baltimore.
American Review of Soviet Medicine. New York.
American Review of Tuberculosis. New York.
Anesthesiology. New York.
Annals of Allergy. Minneapolis.
Annals of Internal Medicine. Lancaster, Pa.
Annals of Otology, Rhinology and Laryngology. St. Louis.
Annals of the Rheumatic Diseases. London.
Annals of Surgery. Philadelphia.
*Archives of Dermatology and Syphilology. A. M. A., Chicago.
Archives of Disease in Childhood. London.
Archives de l'Institut Pasteur d'Algérie.
*Archives of Internal Medicine. A. M. A., Chicago.
*Archives of Neurology and Psychiatry. A. M. A., Chicago.
*Archives of Ophthalmology. A. M. A., Chicago.
*Archives of Otolaryngology. A. M. A., Chicago.
*Archives of Pathology. A. M. A., Chicago.
Archives of Physical Therapy. Chicago.
*Archives of Surgery. A. M. A., Chicago.
Archivos argentinos de pediatría. Buenos Aires.
Arizona Medicine. Phoenix.
Australian and New Zealand Journal Surgery. Sydney.
Brain. London.
British Heart Journal. London.
British Journal of Dermatology and Syphilis. London.
British Journal of Experimental Pathology. London.
British Journal of Industrial Medicine. London.
British Journal of Ophthalmology. London.
British Journal of Radiology. London.
British Journal of Surgery. Bristol.
British Journal of Tuberculosis. London.
British Journal of Urology. London.
British Journal of Venereal Diseases. London.
British Medical Journal. London.
Bulletin of the Johns Hopkins Hospital. Baltimore.
Bulletin of the New York Academy of Medicine. New York.
Bulletin of the U. S. Army Medical Department. Washington, D. C.
California and Western Medicine. San Francisco.
Canadian Journal of Public Health. Toronto.
Canadian Medical Association Journal. Montreal.
Cancer Research. Baltimore.
Chinese Medical Journal. Washington, D. C.
Connecticut State Medical Journal. Hartford.
Delaware State Medical Journal. Wilmington.
Deutsche medizinische Wochenschrift. Leipzig.
Deutsche Zeitschrift für Chirurgie. Berlin.
Diseases of Chest. Chicago.
Edinburgh Medical Journal.
Endocrinology. Springfield, Ill.
Experimental Medicine and Surgery. Brooklyn.
Gastroenterology. Baltimore.
Hawaii Medical Journal. Honolulu
Illinois Medical Journal. Chicago.
Journal of Allergy. St. Louis.
Journal of the Arkansas Medical Society. Fort Smith.
Journal of Aviation Medicine. St. Paul.
Journal of Bone and Joint Surgery. Boston.
Journal of Clinical Endocrinology. Springfield, Ill.
Journal of Clinical Investigation. Boston.
Journal of Experimental Medicine. New York.
Journal of the Florida Medical Association. Jacksonville.
Journal of Hygiene. London.
Journal of Immunology. Baltimore.
Journal of the Indiana State Medical Association. Indianapolis.
Journal of Industrial Hygiene and Toxicology. Baltimore.
Journal of Infectious Diseases. Chicago.
Journal of International College of Surgeons. Chicago.
Journal of the Iowa State Medical Society. Des Moines.
Journal of the Kansas Medical Society. Topeka.
Journal of Laboratory and Clinical Medicine. St. Louis.
Journal of Laryngology and Otology. London.
Journal-Lancet. Minneapolis.
Journal of the Maine Medical Association. Portland.
Journal of the Medical Association of the State of Alabama. Montgomery.
Journal of the Medical Association of Georgia. Atlanta.
Journal of the Medical Society of New Jersey. Trenton.
Journal of Mental Science. London.
Journal of the Michigan State Medical Society. Lansing.
Journal of the Missouri State Medical Association. St. Louis.
Journal of the Mount Sinai Hospital. New York.
Journal of the National Cancer Institute. Washington, D. C.
Journal National Malaria Society. Tallahassee, Fla.
Journal of Nervous and Mental Disease. New York.
Journal of Neuropathology and Experimental Neurology. Baltimore.
Journal of Neurophysiology. Springfield, Ill.
Journal of Neurosurgery. Springfield, Ill.
Journal of Nutrition. Philadelphia.
Journal of Obstetrics and Gynaecology of British Empire. Manchester.
Journal of the Oklahoma State Medical Association. Oklahoma City.
Journal of Pediatrics. St. Louis.
Journal of Pharmacology and Experimenjal Therapeutics. Baltimore.
Journal of Physiology. Cambridge.
Journal of the South Carolina Medical Association. Florence.
Journal of the Tennessee State Medical Association. Nashville.
Journal of Thoracic Surgery. St. Louis.
Journal of Urology. Baltimore.
Kentucky Medical Journal. Bowling Green.
Khirurgiya. Moscow.
Klinische Wochenschrift. Berlin.
Lancet. London.
Medical Annals of the District of Columbia. Washington.
Medical Journal of Australia. Sydney.
Medicina. Madrid.
Medicine. Baltimore.
Medizinische Klinik. Berlin.
Military Surgeon Washington, D. C.
Minnesota Medicine. St. Paul.
Nebraska State Medical Journal. Lincoln.
New England Journal of Medicine. Boston.
New Orleans Medical and Surgical Journal.
New York State Journal of Medicine. New York.
New Zealand Medical Journal. Wellington.
North Carolina Medical Journal. Winston-Salem.
Northwest Medicine. Seattle.
Ohio State Medical Journal. Columbus.
Pediatria prática. São Paulo.
Pennsylvania Medical Journal. Harrisburg.
Physiological Reviews. Baltimore.
Practitioner. London.
Prensa Médica Argentina. Buenos Aires.
Psychiatric Quarterly. Utica, N. Y.
Psychosomatic Medicine. Baltimore.
Public Health Reports. Washington, D. C.
Puerto Rico J. Public Health & Tropical Medicine. San Juan.
Quarterly Journal of Medicine. Oxford.
Quarterly Journal of Studies on Alcohol. New Haven, Conn.
Radiology. Syracuse, N. Y.
Review of Gastroenterology. New York.
Revista argentina de neurologia y psiquiatría. Rosario.
Revista de la Asociación Médica Argentina. Buenos Aires.
Revista clinica española. Madrid.
Revista médica brasileira. Rio de Janeiro.
Revista médica de Chile. Santiago.
Rhode Island Medical Journal. Providence.
Rocky Mountain Medical Journal. Denver.

*Cannot be lent.

South African Journal of Medical Sciences. Johannesburg.
Southern Medical Journal. Birmingham, Ala.
Surgery. St. Louis.
Surgery, Gynecology and Obstetrics. Chicago.
Texas State Journal of Medicine. Fort Worth.
Transactions of the Royal Society of Tropical Medicine and Hygiene. London.
Union Médicale du Canada. Montreal.
United States Naval Medical Bulletin. Washington, D. C.
Virginia Medical Monthly. Richmond.
*War Medicine. A. M. A., Chicago.
Western Journal of Surgery, Obstetrics and Gynecology. Portland, Ore.
West Virginia Medical Journal. Charleston.
Wiener klinische Wochenschrift. Vienna.
Wiener medizinische Wochenschrift. Wien.
Wisconsin Medical Journal. Madison.
Yale Journal of Biology and Medicine. New Haven.
Zeitschrift für die gesamte Neurologie und Psychiatrie. Berlin.

SUBJECT INDEX

This is an index to all the reading matter in THE JOURNAL. in the Current Medical Literature Department only the articles which have been abstracted are indexed.

The letters used to explain in which department the matter indexed appears are as follows: "BI," Bureau of Investigation; "E," Editorial; "C," Correspondence; "OS," Organization Section; "ab," abstracts; the star (*) indicates an original article in THE JOURNAL.

This is a subject index and one should, therefore, look for the subject word, with the following exceptions: "Book Notices," "Deaths," "Medicolegal Abstracts" and "Societies" are indexed under these titles at the end of the letters "B," "D," "M," and "S." State board examinations are entered under the general heading State Board Reports, and not under the names of the individual states. Matter pertaining to the Association is indexed under "American Medical Association." The name of the author, in brackets, follows the subject entry.

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Acad.—Academy *Indust.—Industrial*
Am.—American *Internat.—International*
A.—Association *M.—Medical*
Coll.—College *Med.—Medicine*
Commn.—Commission *Nat.—National*
Comm.—Committee *Pharm.—Pharmaceutical*
Conf.—Conference *Phys.—Physicians*
Congs.—Congress *Soc.—Society*
Dist.—District *Surg.—Surgery*
Found.—Foundation *Surgs.—Surgeons*
Hosp.—Hospital *S.—Surgical*

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